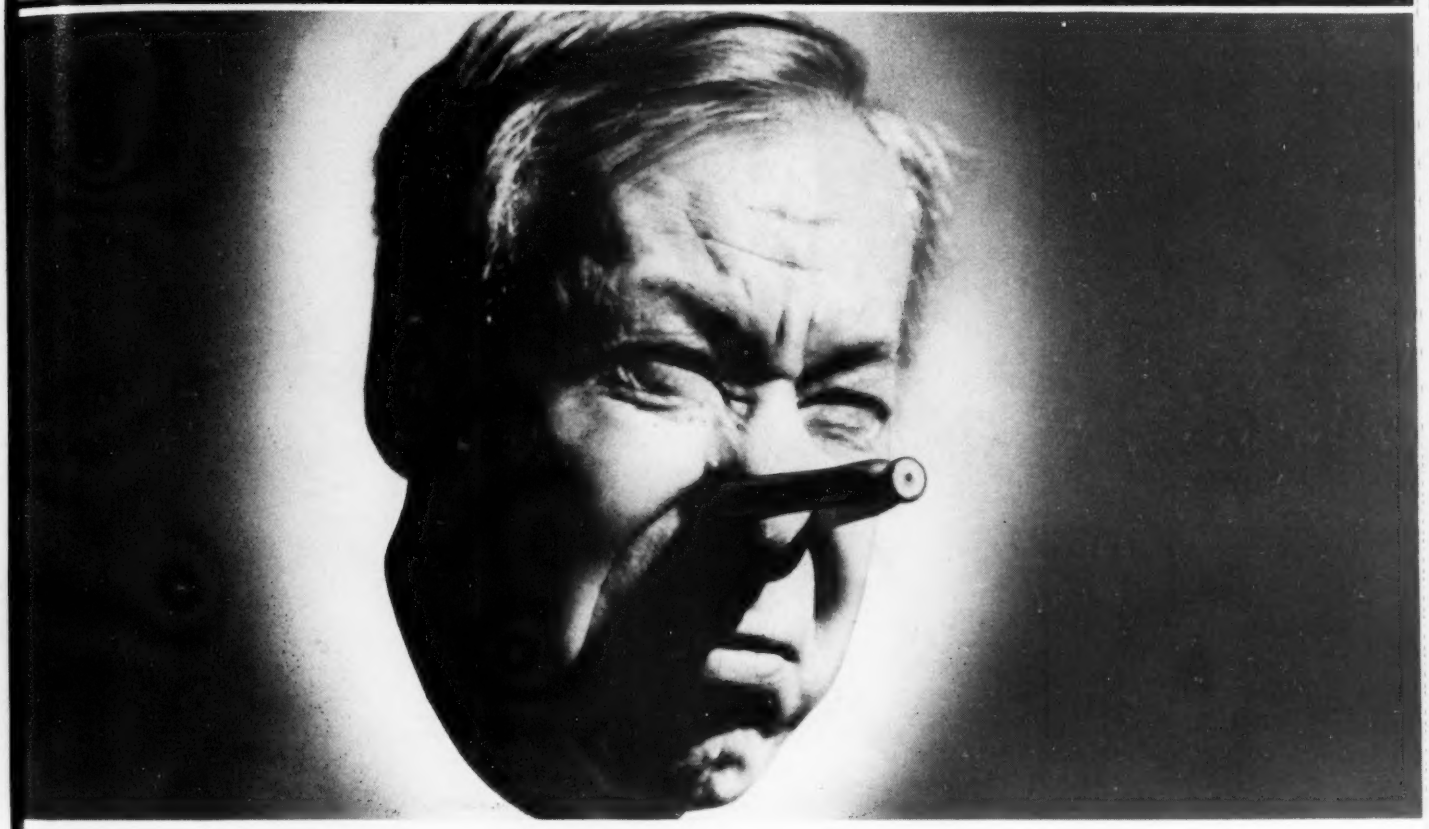
August 30, 1948

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 19



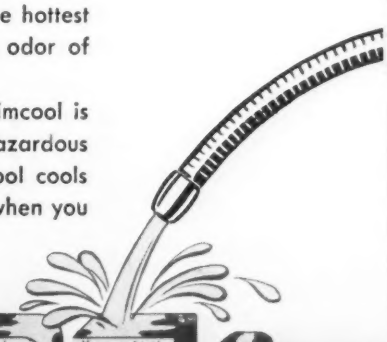
HOW TO DEODORIZE A JOB...

Every operator in your shop will realize he has a better job when you take the odor out of it. And all you have to do is specify Cimcool.

Cimcool is the revolutionary cutting fluid that isn't subject to rancidity even in the hottest weather. It's a *chemical emulsion*. Can't burn. Can't smoke. Has no objectionable odor of its own.

And those aren't the only reasons why operators like their jobs better when Cimcool is on the job. Cimcool is clean to work with, doesn't soil hands or clothes. Leaves no hazardous slippery film on hands, machine, work or floor. Contains no skin irritants. And Cimcool cools so fast that tools and chips actually stay cool to the touch. You'll get better production when you make jobs better with Cimcool!

CIMCOOL DIVISION OF THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO, U. S. A.



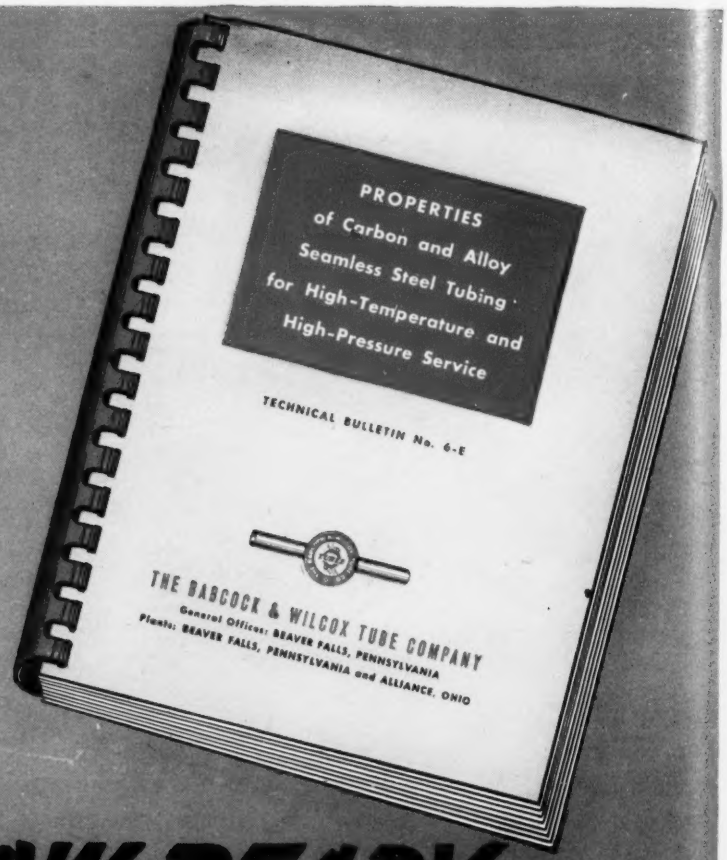
CIMCOOL *for* 85%

Trade Mark Reg. U.S. Pat. Off.

OF ALL METAL CUTTING JOBS

NEW EDITION

of this Valuable TUBING DATA



NOW READY

147 pages of up-to-date metallurgical and application data on steel tubing for high-pressure, high-temperature services.

In this sixth edition of Technical Bulletin 6-E, B&W makes available 147 pages of the latest information on properties and uses of stainless, alloy and carbon steel tubing for high-pressure and high-temperature services in all industries. Included in this are comprehensive and authoritative reference data on newest developments in alloy tubing—results of extensive field and laboratory research —service experience with tube applications—and much additional information of value to tube users accumulated since the previous edition in 1941.

Every user of pressure tubing will find this new book helpful. So request your copy today—on your Company letterhead.

TA 1458S

B&W

Seamless and Welded Tubular Products in a full range of Carbon, Alloy, and Stainless Steels for All Pressure and Mechanical Applications.

★ ★ ★

Other B&W Products

THE BABCOCK & WILCOX CO.

85 LIBERTY STREET · NEW YORK 6, N. Y.

Stationary and Marine Boilers . . . Boiler Components . . . Pulverizers . . . Fuel Burning Equipment . . . Refractories . . . Chemical Recovery Units . . . Process Equipment . . . Alloy Castings.

BABCOCK & WILCOX

SEAMLESS & WELDED TUBES

THE BABCOCK & WILCOX TUBE COMPANY

GENERAL OFFICES: BEAVER FALLS, PA.

PLANTS: BEAVER FALLS, PA. AND ALLIANCE, OHIO.

5.4 or 108 inch . . . every *Magic-Grip* Sheave is "Easy On . . . Easy Off!"

Largest Ever Built! This specially-built 108 inch *Magic-Grip* sheave was ordered for the same reason that thousands of smaller stock sheaves are ordered. It comes completely assembled . . . goes on the shaft without a struggle . . . grips like a vise . . . and is just as easily removed! Stock *Magic-Grip* sheaves from 1 to 250 hp are available through your nearest Allis-Chalmers dealer or district office.

Get Magic-Grip Sheaves In "Pre-Engineered" Drives

New 144-page "Pre-Engineered" *Texrope* drive manual lists 22,000 economical stock drives from 1 to 150 hp — meets 90% of all V-belt drive requirements. Ask for Bulletin 20B6956. ALLIS-CHALMERS, MILWAUKEE. *Texrope, Super-7, Texsteel, Texdrive, Magic-Grip* and *Vari-Pitch* are Allis-Chalmers trademarks.

A 2430

A Complete Range of Products		
Super-7 V-belts	5 types . . . sizes to suit every power transmission job	
Texsteel, Texdrive, Magic-Grip	Sheaves in a full range of sizes and grooves	
Vari-Pitch Sheaves	Exact variations in speed — Stationary or Motion control	
Speed Changers	Speed variations up to 375% at the turn of a crank	

Texrope Super-7 V-belts result from the cooperative research of Allis-Chalmers and B. F. Goodrich; and are sold only by A-C dealers and offices.

ALLIS-CHALMERS

Originators of the Multiple V-belt Drive for Industry

Behind the Scenes...

Predicted Billions

After wading through a lot of figures in the Survey of Current Business for July, we have discovered that there is now room for loud clap of the hands aimed upstairs at our editoral department. Back in the first issue of 1947, which was our Yearbook of Industry issue, we printed a special section in which the staff did a lot of clairvoyance work, with the able assistance of several thousand metalworking executives who answered the questions our editors asked. The biggest and toughest of all the 64 dollar questions was the one which asked, "How many dollars worth of business will the metalworking industry produce during 1947?" All the boys had to go on was a relatively puny $19 billion production way back in 1939, but they looked wisely into the crystal ball, muttered something about medians, modes and weighted averages, took a deep breath and pronounced some unintelligible gibberish. The book then came out with a figure of $55 billion production for the year ahead. Lots of people around here thought they were slightly optimistic, to put it mildly, because there were strike threats in the air, material shortages all around, and other things which could well hob up a good estimate. And it wasn't until the July issue of the Survey of Current Business, 18 months later, that they knew for sure what the answer was. Well, as we started out to say away up above, we have now added all the figgers on our little gray abacus, and we tally the total at $59 billion. That's why we're joining the editors' claque. This year, incidentally, their figger is $60 billion. We'll try to remember to tell you about that one year from now. However, on the strength of past performances, it might be a good idea to keep the eyes on future predictions of our staff! (Aside to Joe, the bookie—run upstairs and see what they're saying about the American League Pennant & the World's Serious).

We're Relaxing

Wanna know a secret? While you're reading this we're really on vacation. While you are suffering from the heat, we're lolling in the hammock. While you're comfortably dry in your snug warm office, we're beating about the countryside in the rain. And while you're wrestling with the current problems of the metalworking industry, we're curled up with a long, cold drink, a good book, and a blacksnake whip to beat the kids off with. We've turned the reins of this page over to the boss—he's in the driver's seat, and for the next two (or maybe three) issues, he will have to carry on. If you don't get the right answers to the problems, blame him. You'll note that everyone's sorry to see us go—even the production department had the usual color removed from this page and substituted a good, solid black!

Hot & Cold Flashes

We've known for a long time that our industry was well supplied with hot-heads, judging only by the comments we've seen in print and heard in private. Wasn't until we were reading the issue of August 23 that we had any inkling of where they all originated. We noted with glee that the author of an excellent article on hard die inserts was also the general foreman of the hotheading department of Oliver Iron & Steel Corp., Pittsburgh. Of course it is also true that the same industry that produces hotheads also produces hot tops, as well as a process for reversing the situation, cold heading.

See You at the Show

Our department of shows and expositions tells us that we'll be on hand at the Iron & Steel exposition, right here in Cleveland, in about four weeks. If you're making plans to be present for those doings, be sure to look us up. Always like to have a chance to say hello to the readers, and provide a few soft seats for tired conventioners!

Puzzle Corner

Our astute druggist of a fortnight ago had his weights made up as follows: ½-gram, 1½ grams, 4½ grams, 13½ grams and 40½ grams. With these he could weigh up to 60½ grams. Don't forget that he could put weights on either or both pans! That seems to wind up the puzzles for the moment. If you would like to have this puzzle corner continued, we are in need of some sharp new numbers, so send them along and we'll start them up again this fall.

Shrdlu

(Editorial Index—page 19)

STEEL
Vol. 123—No. 9 August 30, 1948

BUSINESS STAFF

GEORGE O. HAYS
Business Manager

ADVERTISING

R. C. JAENKE
Advertising Manager

C. H. BAILEY
Service Manager

A. V. ANDERSON
Production Manager

New York:
E. W. KREUTZBERG, K. A. ZOLLNER
Pittsburgh:
S. H. JASPER, B. C. SNELL
Chicago:
L. C. PELOTT, V. G. BRETTMAN
Cleveland:
D. C. KIEFER, H. G. ROWLAND
Los Angeles:
F. J. FULLER

•

CIRCULATION AND MARKET RESEARCH

J. W. ZUBER
Director
R. L. HARTFORD
Research Manager
H. E. METZNER
Circulation
R. C. RICE
Readers' Service
G. R. EBERSOLE
Mail & List Service

Field Representatives:
C. A. PRICE, H. R. DUNNE, D. G. HEWITT
W. L. POLAND, CALVIN FISHER, JR.

•

MAIN OFFICE
Penton Building, Cleveland 13, Ohio
Main 8260

BRANCH OFFICE
New York 17 .....16 East 43rd St.
Murray Hill 2-2581
Chicago 11.....520 North Michigan Ave.
Whitehall 1234
Pittsburgh 19 .....2806 Koppers Bldg.
Atlantic 3211
Los Angeles 4.130 N. New Hampshire Ave.
Fairfax 1758
London: 2 Caxton St., Westminster, S.W.1

• • •

Published by THE PENTON PUBLISHING Co., Penton Building, Cleveland 13, Ohio, E. L. SHANER, President and Treasurer; G. O. HAYS, Vice President and General Manager; R. C. JAENKE, Vice President; F. G. STEINEBACH, Vice President and Secretary; E. L. WERNER, Assistant Treasurer. Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1948 by the Penton Publishing Co.

Editorial Staff on Contents Page

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 123, NO. 9 AUGUST 30, 1948

EDITORIAL STAFF

E. L. SHANER
Editor-in-Chief

IRWIN H. SUCH
Editor

WM. M. ROONEY
News and Markets Editor

JAY DEEULIS
Engineering Editor

J. D. KNOX — *Steel Plant Editor*
GUY HUBBARD — *Machine Tool Editor*

DON S. CADOT
Art Editor

ALLEN G. GRAY
Consulting Editor

ASSOCIATE EDITORS

W. J. CAMPBELL • FRANK R. BRIGGS
VANCE BELL • WALTER F. TOERGE
DAN REEBEL

ASSISTANT EDITORS

H. C. TUTTLE • DOLORES K. BLAHA
HENRY J. HOLTZ • L. J. SKUDERIN
JOHN S. MORGAN • M. T. BORGERHOFF
EDWIN L. KARPICK

RESIDENT EDITORS

E. C. KREUTZBERG
Washington Editor

B. K. PRICE
Eastern Editor, New York

L. E. BROWNE
Associate Editor, New York, Boston

J. C. SULLIVAN
Pittsburgh Editor

E. F. ROSS — *Chicago Editor*
A. H. ALLEN — *Detroit Editor*

VINCENT DELPORT
European Editor, London

EDITORIAL CORRESPONDENTS

R. W. KINCEY, *Birmingham*
L. C. FELDMANN, *Buffalo*
SAMUEL S. CARR, *Cincinnati*
MAC HUTCHENS, *St. Louis*
GEORGE R. REISS, *Youngstown*
MAURICE BEAM, *Los Angeles*
ROBERT BOTTORFF, *San Francisco*
R. C. HILL, *Seattle*
C. K. CATES, *Dallas*
F. S. TOBIN, *Toronto*
J. A. HORTON, *Birmingham, Eng.*
LEON JAUDOIN, *Paris, France*
JACQUES FOULON, *Liege, Belgium*

MAIN OFFICE

Penton Building, Cleveland 13, Ohio
Main 8260

BRANCH OFFICES

New York 17 ..... 16 East 43rd St.
Murray Hill 2-2581

Chicago 11 ..... 520 North Michigan Ave.
Whitehall 1234

Pittsburgh 19 ..... 2806 Koppers Bldg.
Atlantic 3211

Detroit 2 ..... 6560 Cass Ave.
Madison 3024

Washington 4 ... 1123 National Press Bldg.
Executive 6849

Los Angeles 4 .. 130 N. New Hampshire Ave.
Fairfax 1758

London .2 Caxton St., Westminster, S.W.1

Business Staff on Page 4

NEXT WEEK . . .

How to Machine and Finish Aluminum Alloy Castings

Diversified Applications of Stainless Clad Steel

Tool and Die Materials—Selection, Application—Part IV

Applied X-Ray Metallography

NEWS

★ As the Editor Views the News 21
★ News Summary 25
Founders See Sharp Curtailments 27
Warehouses Fear Restricted Markets 29
Bolt, Nut Price Setup Still Snarled 30
Reserve Mining Readies Pelletizing Plant 31
Nine Per Cent of Steel Output Allocated 32
★ Calendar of Meetings 33
★ Windows of Washington 34
German Steel Price Lid Holds—Uneasily 37
Barge Steel Shipments Limited 38
★ Mirrors of Motordom 41
Westinghouse West Coast Plant Booms 44
★ Briefs 45
★ The Business Trend 46
★ Men of Industry 48
★ Obituaries 53
★ Construction and Enterprise 118

TECHNICAL

★ Engineering News at a Glance 55
Advantages of Chromium Plating 56
★ Seen and Heard in the Machinery Field 58
Fundamentals of Forging Practice—Part VII 59
Cutting Tool and Die Materials—Part III 64
★ Progress in Steelmaking—Adirondack Iron Ore Mining 72
Handling of Light Metal Parts Expedited with Lift Trucks 77
National Instrument Conference and Exhibit 78
Technical Program 78
Exhibitors at the Conference 80
Mechanized Foundry Operations 81
★ New Products and Equipment 89
★ Helpful Literature 93

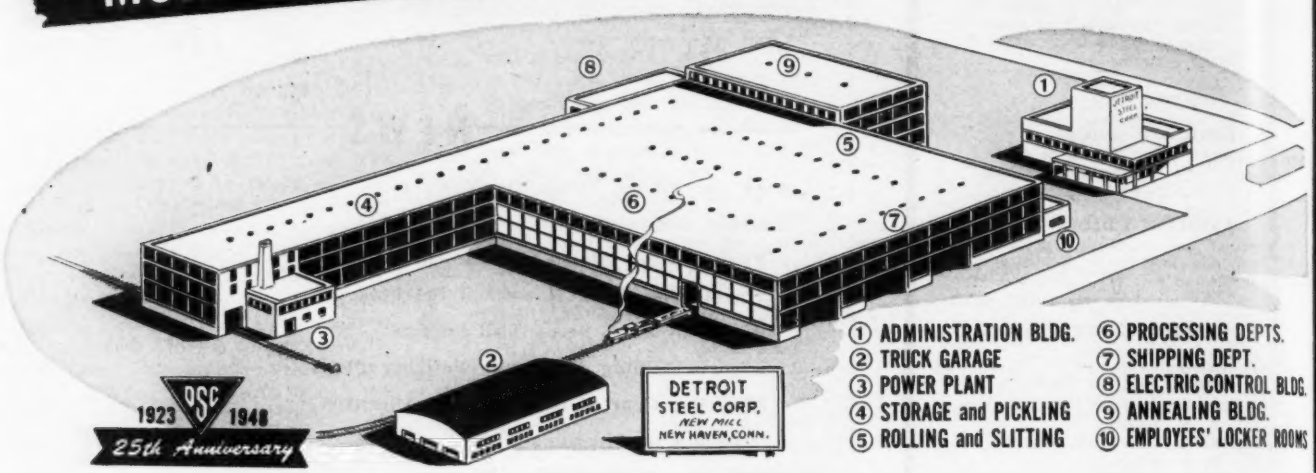
MARKETS

★ Market Summary 95
★ Market Prices and Composites 96
Stockpiling of Strategic Materials To Be Accelerated 100

★ *Index to Advertisers* 126

★ Denotes Regular Features.

MORE STEEL COMING FOR DSC CUSTOMERS



Sky-View Illustration of General Layout of Our New Eastern Plant

Here's How We're Going to Have More Steel for You . . . .

Dependable Dan Our Customers' Man Invites Correspondence Regarding Your Normal and Regular Requirements

Frankly, we may be unable to accept new business now, but looking ahead, we would like to keep you informed about our expanding facilities.

Now under construction . . . a big, new cold rolled strip mill in New Haven, Conn., scheduled to begin rolling by January 1, 1949 . . . to give Eastern customers 60,000 tons additional producing capacity . . . . practically at their stockroom doors.

Improvements at our Detroit Mill to step up that unit's producing capacity to 150,000 tons a year . . . to increase the supply of cold rolled strip available to Midwestern customers by about 35,000 tons a year.

And D.S.C. Reminds You . . . .

That our Detroit mill . . . our Reliance Division network and our Craine-Schrage Steel Division will continue to do everything possible to keep your production rolling . . giving every account equitable consideration . . . constantly planning and working toward greater production and supply . . . and towards higher standards of steel service.

DETROIT STEEL CORPORATION

PRODUCERS OF
COLD ROLLED STRIP STEEL

DETROIT 9, MICHIGAN

RELIANCE STEEL DIVISION

PROCESSORS AND DISTRIBUTORS OF JOB-FITTED SHEET AND STRIP STEEL

General Office: 1025 South Oakwood Ave., Detroit 25, Mich.
Plants: Chicago, Cleveland, Detroit, Lyndhurst, N. J., Worcester, Mass.
Sales Offices: Grand Rapids, Indianapolis, New Haven, Philadelphia, St. Louis, Toledo
Products: SHEETS—Hot Rolled . . . Hot Rolled Pickled . . . Cold Rolled . . . Long Terne . . . Galvanized; PLATES; COLD ROLLED STRIP STEEL—Coils and Cut Lengths . . . Slit or Round Edge . . . All Tempers.

★ ★

CRAINE-SCHRAGE STEEL DIVISION

DISTRIBUTORS AND DIRECT MILL REPRESENTATIVES

Warehouse and General Office: 8701 Epworth Blvd., Detroit 4, Mich.
Sales Offices: Grand Rapids, Toledo, Indianapolis
Products: Cold Drawn and Hot Rolled Carbon and Alloy Steel Bars . . . Tool Steels . . . Drill Rod . . . Wire Rope, etc.

August 30, 1948

Why They Protest

Bobbing up repeatedly in the sound and fury attending hearings on lease of the government-owned Republic No. 5 blast furnace and nearby coke plant to Kaiser-Frazer Corp. is evidence that some of the principals in the case and a few senators and congressmen who profess interest in it are badly misinformed regarding the motives of foundrymen who are presenting testimony.

Henry Kaiser telegraphed Raymond Collier, executive vice president of Gray Iron Founders' Society, attacking statements made by him as "untrue and misleading" and hinting that K-F may take legal action against him. At the hearing in Washington on Wednesday, Senator Murray of Montana said he was surprised to learn that immediately after K-F contracted to operate the plant "a lot of small operators were looking on Republic Steel as their defender."

Such statements implying that foundrymen are acting as stooges for Republic indicate clearly that Kaiser, Murray and others miss the main point of the foundrymen's predicament.

Unfortunately the apprehension of foundrymen in the current situation is identical with that voiced by hundreds of steel consumers time and time again during the past several years. These buyers have had to watch helplessly while one source of supply after another has disappeared. Strong companies, seeking to insure reliable sources of supply, have purchased mills and furnaces. In each case iron or steel which had been sold in the open market was siphoned off through these purchases to supply the plants of the purchaser or of his affiliates, resulting in an ever diminishing supply for consumers who buy in the open market.

In the Republic blast furnace situation, foundrymen are not as much concerned with who gets the furnace as they are with assurances that the present flow of pig iron will continue uninterruptedly.

Now that the WAA-Republic-K-F-Tucker mess is being aired so thoroughly, it is to be hoped that the plight of foundrymen will receive the attention it deserves. Also it is time that executives of powerful industrial corporations, as well as government officials, recognize the fact that acquisitions, mergers, disposition of government plants and other transactions which subtract substantial tonnage from the open market spell disaster for hundreds of small but tremendously important companies.

* * *

MIRACLE OF AMERICA: A brief item in "Mirrors of Motordom" calls attention to the interesting fact that recently the 100,000,000th vehicle built by the American automotive industry emerged from some unidentified assembly line.

Viewed from any angle, this is an amazing achievement. It speaks volumes for the American system of enterprise which, throughout most of the half-century during which this unprecedented feat was being accomplished, encouraged the individual to take risks in order to win success. It argues strongly for the American concept of competition as contrasted to the Continental penchant for cartels. It supports the reasoning of true liberals who contend that the primary function of industry is to provide more goods for more people at lower cost. It provides one of the most tangible exhibits available anywhere in the world that the system which makes the individual superior to the state is preferable to fascism, communism or other

(OVER)

AS THE EDITOR VIEWS THE NEWS

"isms" which subordinate the citizen to the all-powerful state.

Nowhere in the world at any time has any nation developed the capacity to produce, much less the ability to purchase, that which is represented in 100 million automotive vehicles. Nowhere at any time has production and consumption on this scale resulted in such drastic changes in the social, economic and political development of a nation and of the world.

Notwithstanding all of these phenomenal achievements, we probably have with us today an infant development which—50 years from now—may have far exceeded the automotive industry in significant accomplishment. Is it electronics, atomic energy or a thus-far unrecognized discovery? —p. 42

* * *

ALLOT 9% OF STEEL: Voluntary allocations programs already approved will take 491,298 tons per month or about 9 per cent of total steel shipments during the fourth quarter.

Chief beneficiary of these allotments will be the freight car building and repair program, which will receive 248,250 tons monthly. Armed services will receive 102,500 tons per month, tankers 40,380 tons, warm air heating equipment 29,170 tons, Atomic Energy Commission 20,055 tons and oil barges 20,000 tons.

Programs are being considered for some other steel requirements, but it is doubtful whether they will be approved, and if they are, whether allocations can be made effective during the final quarter. —p. 32

* * *

TRAGEDY IN MUSKEGON: Prolonged strike of the plants of Campbell, Wyant & Cannon Foundry Co. in Muskegon, Mich., again brings to attention the far-reaching and costly adjustments which innocent customers are forced to make when an important source of supply is shut off.

CWC supplied cast camshafts and cylinder blocks for numerous automobile, truck, tractor and engine manufacturers. When it became apparent last June that negotiations between company and union were deadlocked, customers began to seek other sources of supply. In some cases patterns were transferred to other foundries. When the possibilities in this direction seemed to be exhausted, a few manufacturers resurrected their long-idle camshaft dies and are now using forged steel shafts.

Repeated experiences of this kind will force customers to plan more carefully for alternative sources of supply—not only as to multiple suppliers but also as to substitute materials and processes. It is a tragedy when a material or process that has won acceptance in fair competition is forced to give up its advantage because of man's inability to compose labor difficulties. —pp. 28, 41

* * *

SALES AREA TO SHRINK: Steel warehouses are concerned about how mill pricing will affect their business in a buyers' market. Right now warehousemen can sell all the steel they can obtain from the mills but when sharp competition returns warehouses in some areas may be hit hard.

When steel is abundant, warehouse customers will be inclined to purchase from the warehouse from which the lowest freight will be charged. It is believed that this will restrict the area in which a warehouse does business. In some instances it is expected that a warehouse's trading range will shrink from a several-state area to a one-county area. In some localities where there are several warehouses, they all cannot survive on the limited volume of business that will be available.

Shrinking of trading areas is only one of many problems that will arise from mill pricing in a buyers' market. Warehousemen believe that only congressional action can save them from disastrous market disruptions. —p. 29

* * *

TO SHOW INSTRUMENTS: National Instrument Conference and Exhibit will be held in Convention Hall at Philadelphia Sept. 13-17. The event is sponsored by the Instrument Society of Electrical Engineers, American Institute of Physics and American Society of Mechanical Engineers.

Fifteen technical sessions will provide papers and discussion covering a wide range of subjects related to instruments and instrumentation. More than 150 exhibitors participating in the show will display or demonstrate equipment and apparatus for measurement, inspection, testing and control.

Improvement in the field of instruments has been rapid during the past few years. Representatives of the metalworking industries who attend the Philadelphia event will witness convincing evidence of the important role instruments and instrumentation now play in the life of the nation. —p. 78

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

PIG IRON PROBLEM— What is to become of the 400 foundries and other pig iron users supplied by Republic Steel if the latter withdraws from the merchant iron market as result of the transfer of the lease on the government-owned Cleveland stack to Kaiser-Frazer? This was the question uppermost in the minds of casting shop managers who last week carried strong protests against the transfer to Washington (p. 27). Foundries since the war have been operating on a hand-to-mouth basis and at below capacity, due to the pig iron shortage. Republic's customers, if they lose this source for iron, know not where to turn. They are hoping for a deal between the principals that may safeguard their iron supply.

ALLOCATIONS— About 9 per cent of total steel production will be channeled to 10 approved programs under the voluntary allocation plan during the fourth quarter (p. 32). Allocated is one-third of total plate production, about 6 per cent of sheet and strip output.

BASING POINT BLUES— Steel warehouses are perturbed about their prospects for maintaining their markets when steel supply and demand again come into balance. The new pricing system, they fear, will circumscribe sharply the areas in which they can operate (p. 29). The changeover in pricing systems, resulting from the cement case and other courts decisions, also has brought uncertainty to the fastener industry. Some companies have established f.o.b. producing plant prices and intend to adhere to them strictly; others plan to meet competitors' levels (p. 30). Still other industries are proceeding slowly in the matter of changing their pricing policies pending more final determination of national pricing policies. Legislation to legalize the basing point system of pricing may be introduced in the 81st Congress (p. 34).

PELLETIZING PLANT— A new step toward utilizing lower grade ores is being taken at Ashland, Ky., where Reserve Mining Co. soon will start operation of its new pilot plant for pelletizing iron ore (p. 31). While initial experiments will use iron ore concentrates from New York mines, the experiments are expected to provide valuable data for pelletizing taconite concentrates later.

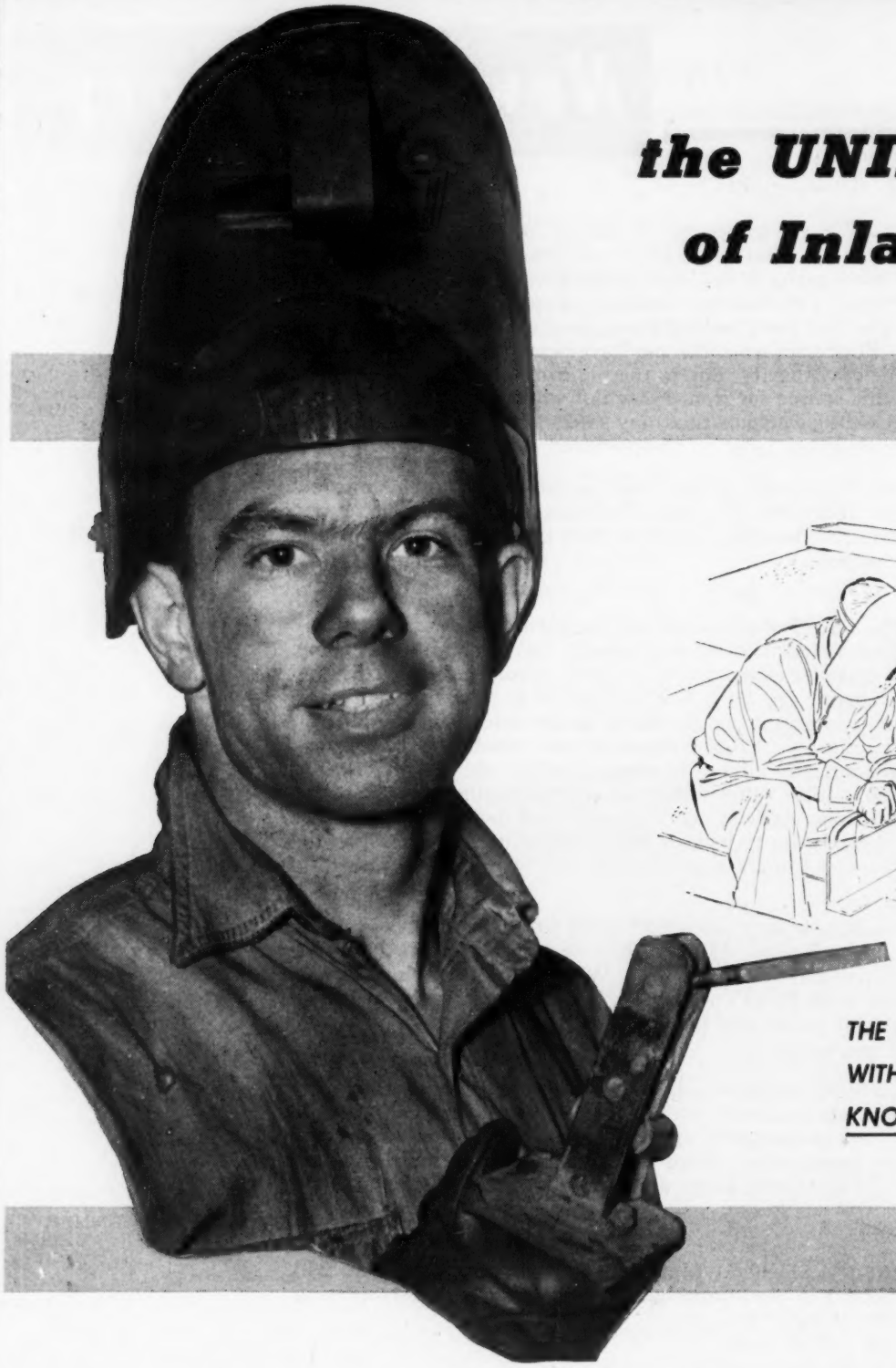
BARGE SHIPMENTS— Steel producers and consumers are studying the feasibility of increasing shipments by barge, although there are no indications of a sharp shift to water carriers immediately (p. 38). Against the often lower costs of barge shipments, steel people must weigh the longer time required for deliveries, and the necessitv for increasing barge and tow boat production and installation of landing facilities.

COST-OF-LIVING WAGES— General Motors average hourly wage rate will go up 3 cents an hour Sept. 1 in accordance with the corporation's cost-of-living wage adjustment formula (p. 42).

NEW AUTO MODELS— Two independent automakers, Nash and Kaiser-Frazer, are taking the wraps off their 1949 models (p. 41). Nash expects to be in production on its new versions within two weeks. K-F changes are relatively minor.

HERE AND THERE IN INDUSTRY— Industrial production is equalling the year's peak levels, with STEEL's index touching 171 per cent of the 1936-39 average for the second time (p. 46) . . . . Forging of steel camshafts for automobiles and trucks is underway in several plants as result of the long and costly strike at the Campbell, Wyant & Cannon foundry in Muskegon, Mich. (pp. 28, 41) . . . . New scrap iron and steel drive will be launched (p. 34) on Sept. 9, under sponsorship of the Office of Industry Cooperation . . . . British foundrymen have established a training center to offer short courses in foundry practice as a means of increasing castings production (p. 37) . . . . Alan Wood Steel Co. has purchased a 30-inch hot sheet mill from Jones & Laughlin (p. 31) to be revamped and installed at Ivy Rock, Pa.

"I like the UNIFORMITY of Inland Steel"



THE MEN WHO WORK WITH INLAND STEEL KNOW ITS QUALITY!

Welders know their jobs are easier . . . results more satisfactory . . . when the steel they work is *uniform*. They also know, from experience, that the steel will be uniform in its chemical and physical properties, *if it's made by Inland.* Special care is taken in every stage of production, to make sure that the Inland steel shipped today will match, in every detail, that received by the customer last week . . . or last year.

INLAND STEEL CO., 38 S. Dearborn St., Chicago, Ill.

Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

INLAND STEEL

BARS • STRUCTURALS • PLATES • SHEETS • STRIP
TIN PLATE • FLOOR PLATE • PILING • REINFORCING BARS • RAILS • TRACK ACCESSORIES

STEEL
A PENTON PUBLICATION

Founders See Sharp Curtailments

Loss of Republic iron as result of lease of government-owned blast furnace to Kaiser-Frazer to affect 400 casting shops and their customers. Deal by principals possible

PRECARIOUS position of foundries in pig iron supply was highlighted last week as the casting shops carried strong protests to Washington against the transfer of a government-owned blast furnace from Republic Steel Corp., its wartime and postwar operator, to the Kaiser-Frazer Corp.

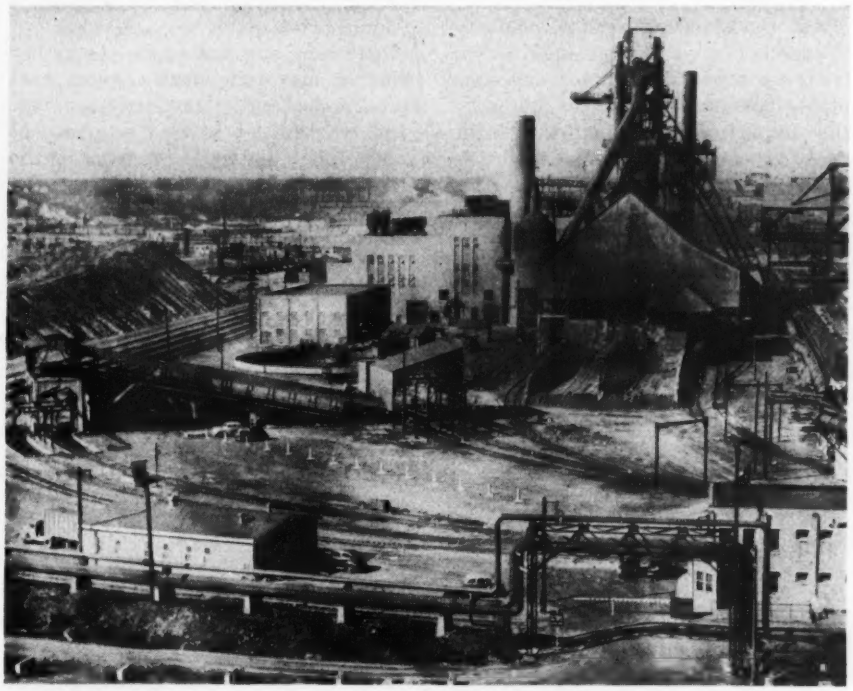
Approximately 400 foundries and other pig iron users in 19 states have been obtaining iron from Republic. While the blast furnace in question produces no merchant iron, its output enables Republic to divert upwards of 250,000 tons of iron from its other northern furnaces for sale to foundries. Should the government-owned stack be transferred to Kaiser-Frazer, Republic said, it would no longer be able to serve its foundry customers.

Some Would Close—Loss of Republic pig iron would result in the closing of some foundries and the curtailment of operations in others, the foundrymen said. This, they pointed out, would mean unemployment for foundry workers and the loss of castings for such essential industries as machine tools, housing, home heating furnaces, engines, pumps, farm machinery, refinery equipment, railroads and others.

The foundrymen pointed out that many casting shops now are operating far below wartime levels, due to shortages of pig iron. A survey by STEEL last December showed that fewer than 20 per cent of foundries were obtaining all the pig iron they needed. Foundrymen say there has been no improvement since that time.

Overshadow Battle of Principals—So much attention was attracted by the protests of the foundries and their customers that their problem overshadowed the primary contest between Republic and Kaiser-Frazer for control of the blast furnace.

Congressional committees which have been prattling about aiding small business found they had an issue made to order for them and the Senate Small Business Committee, headed by Sen. Kenneth Wherry (Rep. Nebr.), and the House subcommittee on executive expenditures, headed by Rep. George Bender (Rep. O.), went to work on a full-scale investigation of the whys and wherefores of the lease by War Assets Administration of the Cleveland stack to Kaiser-Frazer.



GOVERNMENT-OWNED CLEVELAND STACK, CENTER OF CONTROVERSY

Ask Annulment — At a protest meeting held in Cleveland before the congressional inquiry opened, more than 200 gray iron, malleable and steel foundry managers asked the WAA to rescind the lease to Kaiser-Frazer.

The foundrymen said the only interests they had in the matter was obtaining pig iron and that it mattered not to them who operated the furnace as long as they could buy foundry iron. However, they doubted that they could obtain foundry iron if Kaiser-Frazer held control of the furnace, and therefore favored operation by Republic.

Top executives of foundries from Michigan, Pennsylvania, Ohio, New York, and New Jersey declared that the loss of Republic iron would result in serious curtailment of their operations and employment and would work hardship on their customers.

They said the loss of such iron could not be made up from other sources for the reason there were no other sources to which they could turn. Some pointed out that they now are buying foreign pig iron at prices ranging up to $115 a ton in order to maintain operations.

A questionnaire survey of those attending the Cleveland meeting indicated that the loss of Republic iron would result in 82,881 foundry employees being laid off and 563,781 employees of the foundries' customers being furloughed due to lack of castings.

Hit by Mystic Mishap—New England foundries were hard hit by the breakdown of the Everett blast furnace of Mystic Iron Works in July. This stack produced about 90 per cent of the iron melted by New England shops. The furnace will be down until Nov. 1 and meanwhile New England foundries are without adequate sources of iron. Republic and other merchant iron producers have been extending as much aid as possible. Fifteen foundries in Connecticut, three in Vermont, two in New Hamp-

shire and one in Maine have been getting some iron from Republic.

Kaiser Takes 20-Year Lease—Early in the Washington hearings, Henry J. Kaiser announced his company had exercised its option to execute a 20-year lease on the Cleveland stack. Terms of the lease call for a production rental of $2 a ton for pig iron produced and $1.50 a ton for coke produced, based on the existing price of $43 for pig iron. For each $1 increase or decrease in such market price the rentals shall be increased or decreased by 5c a ton for pig iron and 3½c for coke, provided that minimum rentals shall be no less than $1.50 for pig iron and $1.25 for coke and that the aggregate rental be not less than $800,000 annually.

Kaiser-Frazer may purchase that plant during the lease period for $15,200,000.

As the hearing ended, Kaiser-Frazer appeared to have a firm contract for the blast furnace and coke plant, possibly subject to ruling by the Department of Justice on the deal or court action instituted by other interested parties.

Industry observers were speculating on the possibility of Republic and Kaiser working out a deal whereby the facility would be operated on a co-operative basis.

Under the terms of the lease Kaiser-Frazer is permitted to assign all of its rights to another company with prior approval of the WAA.

This might open the way for continued operation of the facility by Republic in return for which the latter company might supply Kaiser-Frazer with steel and a portion of the iron output, at least during the period of acute iron and steel shortage. Conceivably, such a deal would permit Republic to continue to serve its foundry customers.

Strike Cuts Auto Output

STRIKE of Campbell, Wyant & Cannon Foundry Co. plants in Muskegon, Mich., has had serious repercussions on automobile, truck and tractor manufacturers since its start on June 14, and three top federal conciliators gave up after week-long efforts to bring negotiations to a head.

The company had agreed to higher wages, improved vacation plan, hospitalization and other fringe benefits, and was all set to sign a new contract last June when the head of the UAW-CIO local suddenly introduced a demand for the closed shop and checkoff system. This was held by management to be in violation of the Taft-Hartley act and negotiations were broken off.

After weeks of picketing, an injunction was granted by the courts forbidding mass picketing and it was possible to ship out accumulated stocks of camshafts to customers, principally Chrysler divisions, which had used up inventories. Meanwhile a small supervisory force went into one of the idle foundry plants and managed to get a single cupola going to produce sufficient iron to make 50 tons of camshafts daily, which are now being doled out among frantic users.

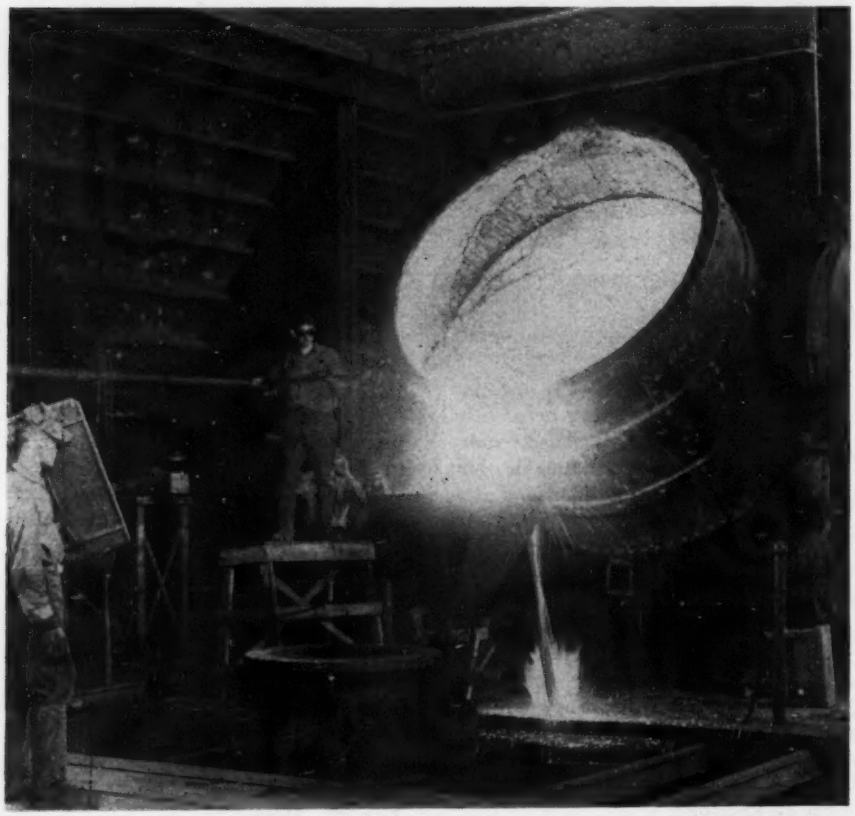
Camshafts Forged—Chrysler has started to forge some shafts at the Dodge plant in Detroit, as have Oldsmobile at Lansing and International Harvester, prior to time the latter's plants were struck. At the same time an Illinois foundry has set up equipment to cast 1500 camshafts daily, to cover requirements of Continental Motors, builder of engines for Kaiser-Frazer and others.

Hudson was forced to close early in August, and remains down, due to exhaustion of inventories of 6 and 8-cylinder blocks, involving production loss of 12,000 cars for the month. However, patterns from the C-W-C plant have been removed to Lakey Foundry & Machine Co., also in Muskegon, and it appeared the Hudson blocks would be coming out of the sand this week. A source for Hudson camshaft forgings is reported to have been located in Ohio.

Ford truck and tractor lines, as well as the Lincoln division, were down for a period due to shortage of blocks.

Use 750-900 Tons Daily — C-W-C plants in Muskegon had been melting between 750 and 900 tons of iron daily until the strike. Time already lost amounts to about 54 days (as of Aug. 27) or the equivalent of 40-50,000 tons of iron. Naturally, in this interval, it has not been possible to maintain shipments of raw materials into the plants.

Cuts Auto Output—Further cutbacks in automotive production because of lack of camshafts from C-W-C appear inevitable since these shafts are of special analysis iron, produced with the aid of many special machines, such as straightening, flame hardening and other units, not found in most gray iron foundries. While it has been possible to pull patterns from the Muskegon plants, they are of little value without the other equipment and melting techniques. About the only alternative is to change to forged steel shafts as some companies have done.



LOSS OF REPUBLIC IRON MAY CAUSE CURTAILMENTS IN 400 CASTING SHOPS

Foundry Advisory Group Formed

MUNITIONS Board of the Military Establishment has appointed a Found-

ry Industry Advisory Committee which will meet late in September to advise the board on foundry matters relating to national defense.

Members of the committee are: Gen. Donald Armstrong, U. S. Pipe & Foundry Co., Burlington, N. J.; George W. Cannon, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich.; Collins L. Carter, Albion Malleable Iron Co., Albion, Mich.; F. Kermit Donaldson, Machined Steel Castings Co., Alliance, O.; O. L. Earl, Acme Aluminum Foundry Co., Chicago; F. Ray Fleig, Smith Facing & Supply Co., Cleveland; John E. Galvin, Ohio Steel Foundry Co., Lima, O.; E. W. Horlebein, Gibson & Kirk Co., Baltimore; Thomas Kaveny Jr., Herman Pneumatic Machine Co., Pittsburgh; Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Va.; A. J. McDonald, American Steel Foundries, Chicago; Wilson H. Moriarty, National Malleable & Steel Castings Co., Cleveland; Thomas W. Pettus, National Bearing Metals Corp., St. Louis; Frank E. Shumann, Lehigh Foundries Inc., Easton, Pa.; Walter L. Seelbach, Superior Foundry Inc., Cleveland; David B. Shannon, Somerville Iron Works, Chattanooga, Tenn.; James H. Smith, Central Foundry Division, General Motors Corp., Saginaw, Mich.; Frank G. Steinebach, *The Foundry,* Cleveland; Fred S. Wellman, Wellman Bronze & Aluminum Co., Cleveland; and J. Donald Zaiser, Ampco Metal Inc., Milwaukee.

Studies Move to Pittsburgh

TIMKEN Detroit Axle Co., producer of truck axles and transmissions, is investigating several locations in the Pittsburgh area to set up a forging and machining plant. If the company is successful in locating a plant site here, it will be the second large steel fabricator to expand operations in the Pittsburgh area since the new system of steel pricing on a mill basis was put into effect.

Col. Willard F. Rockwell, chairman of the board for Timken Detroit Axle Co., states the company wants to "get closer to supply of steel." Col. Rockwell stated that if the company locates here, operations will probably be initiated with several hundred employees. Later, the plant would employ several thousand workers. Timken Detroit Axle Co. now employs more than 10,000 workers in three large plants at Detroit, Oshkosh, Wis., and Ashtabula, O. Recently the firm bought a site at Kenton, O.

In addition to producing truck axles and transmissions, the company makes trailer axles, tractor axles and tractor transmissions and forged railroad bearing boxes.

OPEN HOUSE: To celebrate opening of the thirteenth unit in its nationwide group of steel-service plants, Joseph T. Ryerson & Son Inc., recently held an open-house party at its new facility in Emeryville, Calif. Including a two-story office building which forms an integral part of the warehouse structure, the plant occupies about 170,000 square feet of floor space. The new unit is the company's second on the West Coast, a new plant at Los Angeles having opened in 1946

Warehouses Fear Restricted Markets

Changeover to mill pricing may limit areas they serve when steel supply balances demand. Competition among distributors to be reduced by freight considerations

MANY steel warehouses are worried over how much longer they can stay in business.

Paradoxically, this worry comes now when they can sell all the steel they can obtain from the mills. But in analyzing the position in which the recent swing to mill pricing of steel has put them, warehouse men can't avoid looking with alarm toward the day when a buyer's market returns to steel consumers.

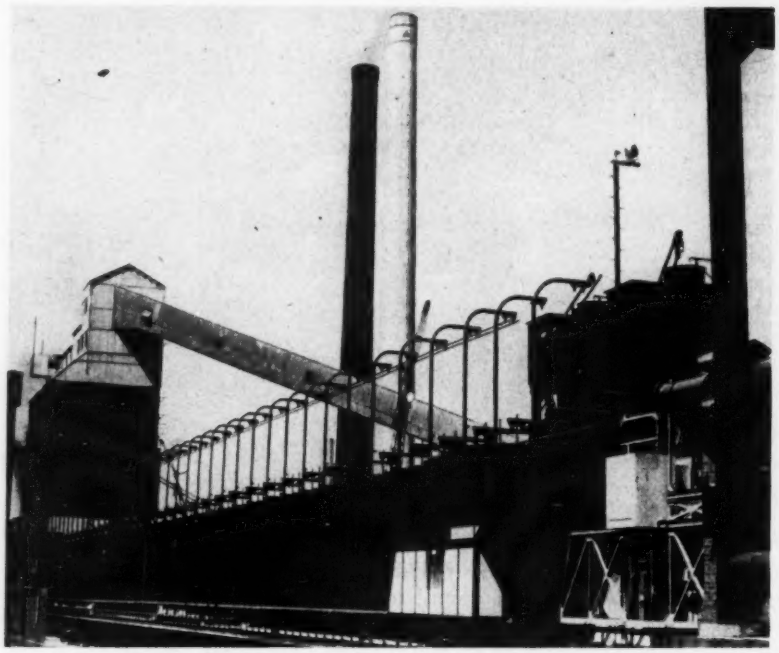
With various sectors of industry abandoning freight absorption because of government opposition to such a practice, warehouses feel they are losing a means of competing with one another for business.

May Limit Market Areas — Under the new pricing practices all of the burden of freight charges is put on the steel buyer, the warehouses no longer absorbing any of the freight. Consequently buyers will be inclined to purchase from the warehouse from which the least freight will be involved in delivery. This means that warehouses will be unable to go far afield for business and that thus their sales areas in many instances will shrink from a several-state area to a one-county area. Where a number of warehouses are located in this one-county area they can't all survive on the business available there, spokesmen for several warehouses observed.

Right now with steel in demand at any price, buyers may voice some complaint over paying freight charges but largely are inclined to be content with getting the steel.

Freight Charges Vary—With warehouses also having to obtain steel now from any available mill source regardless of how much freight they must pay, they in some instances find they must charge more for a certain product than some of their competitors in the same city.

Thus the immediate disadvantages from the change in pricing methods are felt by warehouse customers, particularly those who cannot satisfy their wants at the nearest warehouse or at the one with the lowest price. However, when the buyers' market in steel returns it will be many of the warehouses which will be at the disadvantage. Nevertheless, all the disadvantages will not lift from the warehouse customers, for those who are some distance from a warehouse will have to pay higher freight costs



NEW COKE OVEN BATTERY: Jones & Laughlin Steel Corp. is pushing coke from its new battery of 106 coke ovens recently completed at Aliquippa Works. Battery was installed by Koppers Co. and is the second large battery built at J & L within the past three years. Capacity is 53,350 tons of coke monthly

than competitors situated near a warehouse.

Sole means of avoiding such marketing disruptions, warehouse men say, is congressional action to counteract Supreme Court decisions against multiple basing point pricing and freight absorption.

Bolt, Nut Price Setup Still Snarled

Some producers plan to adhere strictly to f. o. b. plant prices while others plan to meet competitors' levels. Test due soon on price structure

COMPETITION still is the key to pricing policies in the fastener industry. In most instances producers have established prices on an f.o.b. producing plant basis and have declared there will be no deviation from this policy unless marketing developments force a change.

The new consumer discount schedules incorporating the new pricing policies have been issued only since the early part of this month and, hence, have not had time to be tested. The real test of the bolt and nut price structure will not be made until September and the early part of the fourth quarter. Undoubtedly some adjustments will be necessary but whether these will be minor or major is unknown.

Uncertainty arises from the fact that some producers modified establishment of plant prices by reserving the right to adjust prices when considered advisable to meet known competition. Some schedules state that if the published and quoted prices of a competitor result in lower delivered prices than "our f.o.b. factory prices, plus transportation, we desire the opportunity of meeting such lower prices." It will not be known definitely in many instances what the actual cost of fasteners will be to a particular consumer until a firm offer has been made by a producer and counter-offers have been made by other suppliers in bidding for the business.

Many Producing Points—Under the former method of quoting, all sellers had an equal opportunity pricewise to obtain business, regardless of the location of their plants, since a common basing point was used. Under the new system, there are approximately 200 producing points at which prices are based and from which freight rates are computed to arrive at delivered prices. The actual marketing conditions vary greatly also, due chiefly to the fact that in some districts producing facilities exceed consumption while in others the opposite is true.

Changes in pricing policies which have been announced by most producers are not expected to have any immediate effect on the volume of business. Some producers report that July and August sales have been unusually high and current inquiry is being made for shipments as far ahead as early 1949. The volume of new business for the industry as a whole for the first seven months is well above that for the like period a year ago. Production facilities are being operated at as high a rate as supply of raw materials will permit, the latter still being the principal limiting factor in operations.

Backlogs Smaller — Despite the highly satisfactory volume of new business, order backlogs have declined sharply this year. This is accounted for by the increased rate of production and the delayed entry of cancellations received earlier. Cancellations do not reflect a falling off of consumption as much as they reflect a balancing of fastener supplies with those of sheet steel and other materials.

Backlogs reached their peak in 1946 as a result of over-optimistic estimates of nearby requirements coupled with substantial buying to cover anticipated far-forward needs. From the end of the war to 1946, supplies of fasteners were acutely short and progress in balancing production with demand was hampered chiefly by shortages of labor and steel. At the present time, labor supply is not a serious problem and steel shipments from the mills have improved markedly.

Steel Receipts Higher—During the first quarter of this year, bolt, nut, rivet and screw producers received from the mills 349,889 tons of steel compared with 316,596 tons in the first quarter of 1947 and only 192,279 tons in the first three months of 1946. In addition, the fastener industry receives substantial tonnage of steel from warehouses. Steel supply outlook for the fourth quarter indicates a moderate reduction in overall shipments.

Generally speaking, order backlogs now cover the equivalent of about three months' output, with deliveries further extended on such items as cold-punched nuts in the popular size range of ½ to ⅝-inch. Mill deliveries on cold heading wire have recorded little improvement, with the result that output of cold-punched items has been adversely affected due to unbalanced inventories.

Pelletizing Plant

Reserve Mining Co.'s pilot plant at Ashland, Ky., to start operations this autumn

RESERVE Mining Co.'s new pilot plant for pelletizing iron ore concentrates at Ashland, Ky., may be ready to start operating in the next 60 or 90 days.

Commenced about a year ago, the pilot plant is part of the intensive efforts being made by the iron ore and iron and steel industry to utilize low-grade ore and the iron ore bearing rock, taconite, as a substitute for the dwindling supplies of the higher grade direct shipping ores.

The pilot plant is being built at Ashland, Ky., because that is the location of three blast furnaces and several open hearths of Armco Steel Corp. which will use the pellets in experiments. Armco owns one-third of Reserve Mining Co.'s stock. Reserve is managed by Oglebay, Norton & Co., Cleveland.

Use Benson Mine Ore—The pelletizing experiments will begin with the use of ore concentrates of about 67 per cent iron content purchased from Jones & Laughlin Steel Corp.'s Benson ore mine in New York state. Reserve has for some time had in the planning stage taconite concentrating installations for the Lake Superior district. However, the use of ore concentrates available now from New York state will not only permit the pelletizing experiments to start soon but makes it unnecessary to build costly taconite concentrating plants before pelletizing experiments can start.

At the Ashland pilot plant, experiments will be made to determine how best to put ore concentrate into balls or pellets and what type and size of pellets will be suitable for use in production of iron and steel.

Erie To Start Aurora Plant—Elsewhere in the work of developing substitutes for direct shipping ores, Erie Mining Co. is nearly ready to start operating its Aurora, Minn., pilot plant for concentrating and pelletizing taconite. Erie is a subsidiary of Pickands Mather & Co., Cleveland. From the pilot plant the company will obtain operating and cost data which will help determine whether a full-scale production plant should be built, and if so, how it should be equipped.

BLS Summarizes Coke Output

PRODUCTION trends in the coke industry have been summarized statistically by the Bureau of Labor Statistics. Using 1939 as the index year, the bureau has utilized weighted figures from various government sources, chiefly the Bureau of Mines, Department of the Interior.

Year	Production	Production workers	Man-hours	Output per—Production worker	Output per—Man-hour
1939...	100.0	100.0	100.0	100.0	100.0
1940...	128.0	121.2	122.6	105.6	104.4
1941...	146.6	136.2	139.2	107.6	105.3
1942...	158.3	145.0	149.1	109.2	106.2
1943...	159.0	157.7	161.6	100.8	98.4
1944...	164.1	154.2	159.1	106.4	103.1
1945...	147.9	141.2	147.2	104.7	100.5
1946...	128.0	128.8	131.9	99.4	97.0
1947...	160.6	146.8	152.7	109.4	105.2

Koppers Shifts Personnel

CONSOLIDATION of the Shops and Piston Ring Divisions of Koppers Co. Inc. into a new Metal Products Division, announced earlier this month, is rapidly nearing completion, according to Walter F. Perkins, vice president and general manager of the new division.

Mr. Perkins has appointed Edward R. Hall and Lenvik Ylvisaker as assistant general managers. Mr. Hall formerly was assistant general manager of the Shops Division and a divisional vice president. He retains his vice presidency in the new division. Mr. Ylvisaker formerly was assistant general manager of the Piston Ring Division.

Mr. Perkins also announced the appointment of three staff department managers to conduct finance, procurement and personnel activities of the consolidated unit. They are John E. Tellman, finance; B. K. Shaner, procurement; and M. S. Griffith Jr., personnel. All formerly held similar posts with the Shops Division. J. M. Easter has been appointed supervisor, control section, general manager's office.

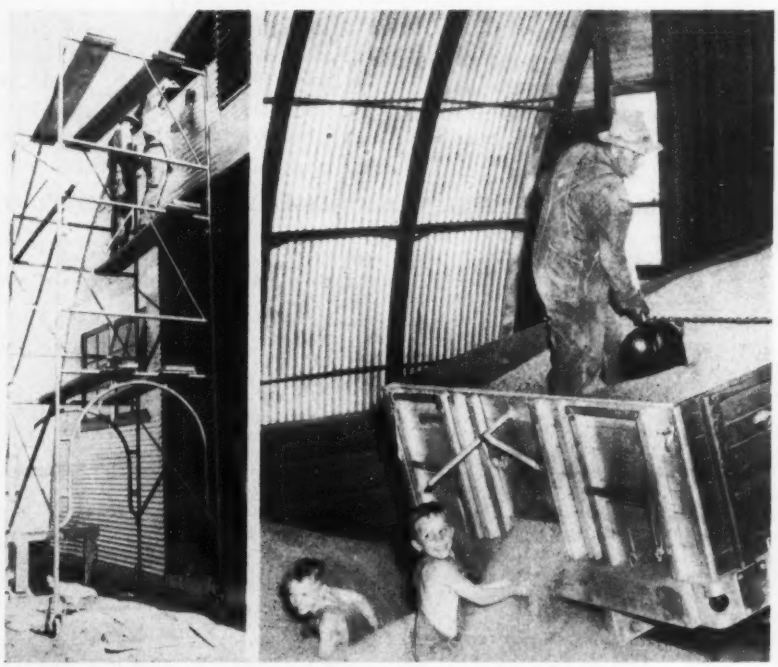
Alan Wood Buys Mill

ALAN WOOD STEEL CO. has purchased a 30-inch hot strip mill from Jones & Laughlin Steel Corp.'s Cleveland works. Mill will be rebuilt by United Engineering and installed at Alan Wood's Ivy Rock works, near Conshohocken, Pa.

Mill was purchased for $1.2 million and the moving, rebuilding and reinstallation will bring total cost of the project to about $8.9 million. Modernized mill will have a capacity of 250,000 tons of hot strip annually and is scheduled to start operations early in 1950.

Alan Wood will also install new pickling facilities, slitting capacity and hot finishing capacity at Ivy Rock, as well as a large new slab heating furnace.

Removal of the mill from the J&L Cleveland works will start soon after Oct. 1 when J&L's new 77-inch mill is placed in operation.



QUONSET SAVES GRAIN: Throughout the country's grain belts, hundreds of quonset buildings are being used to shelter a bumper grain crop until it can be taken in at the elevators. At left, a quonset is shown under construction at Leoti, Kans. At right, children romp in new grain being unloaded in a quonset

Nine Per Cent of Steel Output Allocated

Ten programs approved by industry advisory committee to call for 491,000 tons of finished steel monthly in fourth quarter. Armed services to take 102,500 tons monthly

VOLUNTARY allocations programs already approved will take about 9 per cent of total finished steel shipments during fourth quarter. The ten programs set up to date call for 491,000 tons of steel per month; shipments during the first half of 1948 averaged 5,376,000 tons.

Some additional programs are under consideration, but it is doubtful whether these will be approved, and if they are, whether the allocations can be made effective during the fourth quarter.

Programs to provide steel for bituminous coal mining facilities, machine tools, additional petroleum equipment, truck-trailers, low-pressure steel boilers, terminal storage tanks, house, farm and commercial storage tanks, liquid petroleum gas cylinders, aid to distressed municipalities and warehouse stocks are under study. Some of these are not accorded much chance of being adopted.

Law Expires Feb. 28—Office of Industry Co-operation officials face numerous difficulties is setting up an effective and logical voluntary allocations program. One of these is time. Public Law 395, authorizing the voluntary programs, expires Feb. 28, and while it generally is expected that it will be extended, the uncertainty places handicaps on the OIC.

OIC wants to keep the tonnage of allocated steel within limits that will not disturb too seriously the normal private relationships between steel sellers and buyers. With the allocated tonnage now up to nearly 10 per cent of the total, officials are leery of allocating much more.

Requests which pour into the OIC offices call for steel for a variety of uses, the essentiality of which may be questioned.

Military Needs Larger—The armed services during fiscal 1949 are scheduled to receive 1,269,141 tons of steel, including 199,020 tons of alloy.

This compares with about 800,000 tons taken by the military during the last fiscal year.

Heaviest demands for military steel will come in the October quarter this year when shipments to the armed services are scheduled at 390,870 tons of carbon and alloy products. By quarters, the military allocations are:

Carbon	(Net Tons)
July, 1948	217,716
Oct., 1948	329,668
Jan., 1949	260,779
April, 1949	261,948

Alloy	
July, 1948	37,763
Oct., 1948	61,202
Jan., 1949	48,762
April, 1949	51,289

More than one-fifth of the military allocations will be for sheet and strip, a higher percentage of the light flat-rolled material than has been required by the armed services in past rearmament programs. Twenty-one per cent of the total will be hot and cold-rolled bars, 12 per cent will be for structural shapes and 11 per cent for pipe.

Bethlehem To Build 18 Tankers

BETHLEHEM Steel Co. reports contracts have been signed to build 18 large oil tankers at its Sparrows Point, Md., shipyard. This brings to 22 the number of tankers Bethlehem has contracted to construct. They total 530,000 deadweight tons and have a contract valuation of $110 million.

Fourteen of the new tankers will be of 28,000 deadweight tons and will be the largest vessels ever built in Baltimore. The yard's working force will be increased by 1000 men—to 4000—and the contracts will keep it busy through 1950.

GE Expands Cable Treating Unit

GENERAL Electric Co. has awarded a contract to Blaw-Knox Co. for construction of additional facilities at its cable-treating plant at Schenectady. Contract involves about $400,000.

Building Rubber Tile Plant

GROUND has been broken at Houston, Tex., for a $2,000,000 rubber tile plant for the Wright Mfg. Co., Milwaukee, and at the same time Thomas F. Millane, Milwaukee, president,

MONTHLY STEEL REQUIREMENTS OF APPROVED ALLOCATIONS PROGRAMS

	Sheets, Strip	Plates	Structurals	Bars	Reinforcing Bars	Steel Pipe	Steel Tubing	Axles	Rails	Billets	All Other	Total
U. S. Atomic Energy Commission	900	8,335	2,610	....	2,835	4,550	425	....	400	....	....	20,055
Armed Services	21,250	....	....	....	....	....	....	....	....	....	81,250	102,500
Freight Cars and Repairs	25,400	108,850	53,000	34,000	...	2,900	....	21,100	....	3,000	....	248,250
Warm Air Heating Equipment	29,170	....	....	....	....	....	....	....	....	....	....	29,170
Oil Field Tanks and Production Equipment	8,300	5,869	1,818	....	....	542	....	....	....	....	....	16,529
Construction and Repair of Barges (Oil)	....	20,000	....	....	....	....	....	....	....	....	....	20,000
All-Steel Factory-Made Houses	9,830	....	....	....	....	....	....	....	....	....	....	9,830
Anthracite Coal Industry Equipment	....	....	*2,579	....	....	....	....	....	....	....	....	2,579
National Advisory Commitee for Aeronautics	30	800	620	130	375	....	....	....	....	....	....	2,005
Tankers (New and Repairs)	165	32,625	6,400	....	....	1,190	....	....	....	....	....	40,380
TOTAL	95,145	176,479	67,077	34,130	3,210	9,182	425	21,100	400	3,000	81,250	491,298
Industry's Average Monthly Net Shipments—January Through June	1,602,300	563,434	346,168	799,223	127,101	550,441	....	17,066	182,036	....	....	5,375,988

* Includes some pipe.

declared the company may shift all its operations from Wisconsin to Houston. The parent company, The Taylor Mfg. Co., operates two plants at Milwaukee and one at Racine.

The Houston plant will contain approximate 125,000 sq ft of floor space. Most of the raw materials used in the manufacture of rubber floor tile, including sulphur and synthetic rubber, are abundantly available in the Houston area. Ultimate payroll of 1000 persons is expected.

Gas Range Sales Hit New Peak

RESIDENTIAL gas range sales reached an all-time high of 1,444,000 units during the first 6 months of 1948 and exceeded by 283,000 sales during the first 6 months of 1948, the previous peak year, according to the Gas Appliance Manufacturers Association.

Total 1948 annual production is expected to exceed the previous peak year by approximately 500,000 and reach 2,800,000 units.

Gas ranges for use with bottled gas totaled 375,000 units during the first 6 months of 1948 and approximated 26 per cent of the industry's sales. This compares with 290,000 such units sold during the like period of last year.

AISI To Hold Regional Meetings

AMERICAN Iron & Steel Institute will conduct seven regional technical meetings this fall, similar to the sessions it inaugurated last year.

Meetings will be held in the following cities: Pittsburgh, Sept. 23; Cleveland, Sept. 29; Chicago, Oct. 6; Philadelphia, Oct. 14; Boston, Oct. 21; Birmingham, Oct. 27; and San Francisco, Nov. 5.

The morning program for each of the seven meetings will consist of remarks by Walter S. Tower, institute president; discussion of the work of the Building Codes Division of the institute by B. L. Wood, consulting engineer for the institute; an outline of the institute's technical committees by C. M. Parker, secretary, institute's Committee on Manufacturing Problems; and a discussion of standardization and simplification of steel products by J. G. Morrow, metallurgical engineer, Steel Co. of Canada Ltd.

At the Pittsburgh meeting, in the William Penn Hotel, the following subjects will be presented: Raw materials by K. L. Fetters, Youngstown Sheet & Tube Co.; supersonic testing by L. L. Ferrall, Crucible Steel Co. of America; stainless steel by R. A. Lincoln, Allegheny Ludlum Steel Corp.; and tool steel by D. J. Giles, Latrobe Electric Steel Co.

Hotel Cleveland will be the scene of the Cleveland meeting where the following subjects are scheduled: Raw materials by E. G. Hill, Wheeling Steel Corp.; standard steels and h-band steels by D. H. Ruhnke, Republic Steel Corp.; packaging cold strip and wire by H. F. Jacobsen, American Steel & Wire Co.; and tubular products by E. G. Price, National Tube Co.

At the Stevens Hotel, scene of the Chicago gathering, the following subjects will be presented: Raw materials by H. C. Smith, Great Lakes Steel Corp.; rails and track accessories by J. H. Reece, Colorado Fuel & Iron Corp.; packaging flat-rolled steel by C. E. Miller, Carnegie-Illinois Steel Corp.; and a review of methods of determining carbon in steel by R. L. Wilson, Timken Steel & Tube Division, Timken Roller Bearing Co.

At the Philadelphia meeting, at the Warwick, the following subjects will be discussed: Raw materials by C. H. Herty Jr., Bethlehem Steel Co.; effect of incidental elements on carbon steel plates by J. G. Althouse, Lukens Steel Co; standard steels and h-band steels by E. T. Walton, Pittsburgh Crucible Division, Crucible Steel Co. of America; and tool steel by F. B. Foley, Midvale Co.

In Boston at the Copley Plaza the following subjects will be discussed: Raw materials by Mr. Herty; packaging coiled strip and wire by Mr. Jacobsen; cold-finished bars by H. M. Smith, Wyckoff Steel Co.; and standard steels and h-band steels by P. R. Wray, Carnegie-Illinois Steel Corp.

The Birmingham meeting, at the Tutwiler, will feature discussions of raw materials by R. E. Garrett, Sloss-Sheffield Steel & Iron Co.; pig iron by T. G. Johnston, Republic Steel Corp.; merchant wire products by H. A. Caldwell, Tennessee Coal, Iron & Railroad Co., and C. L. McGowan, Atlantic Steel Co.; and rails and track accessories by J. R. Trimble, Tennessee Coal, Iron & Railroad Co.

At the Mark Hopkins Hotel in San Francisco these subjects are scheduled: Raw materials by Dr. Walter Mathesius, Geneva Steel Co.; wire and wire products by Francis Eickelman, Colorado Fuel & Iron Corp.; quality control in the manufacture of basic steels by H. C. Swett, Bethlehem Pacific Coast Steel Corp.; and flat-rolled steel by R. G. Glass, Geneva Steel Co., and O. L. Pringle, Columbia Steel Co.

New England Show Postponed

NEW England Materials Handling Show, to have been held in Boston Oct. 5-7, has been postponed because it would conflict with the Industrial Packaging & Materials Handling Exposition scheduled for the same time in Chicago.

Calendar of Meetings . . .

Aug. 30-Sept. 3, American Chemical Society: Eastern section of annual meeting, Washington, D. C. Society headquarters are at 60 E. 42nd St., New York.

Sept. 6-10, American Chemical Society: Midwest section of annual meeting, St. Louis. Society headquarters are at 60 E. 42nd St., New York.

Sept. 7-9, Society of Automotive Engineers: National tractor and diesel engine meeting, Hotel Schroeder, Milwaukee. Society headquarters are at 29 W. 39th St., New York.

Sept. 7-10, American Society of Mechanical Engineers: Fall meeting on hydroelectric resources and wood industries of Pacific Northwest, at Portland, Oreg. Society headquarters are at 29 W. 39th St., New York.

Sept. 9-10, American Ceramic Society: Fall meeting, Hotel Conneaut, Conneaut Lake Park, Pa. Society headquarters are at 2525 N. High St., Columbus, O.

Sept. 13-17, Instrument Society of America: Third instrument conference and exhibit, Convention Hall, Philadelphia. Society headquarters are at 1117 Wolfendale St., Pittsburgh.

Sept. 20-25, American Mining Congress: Metal mining convention and exposition, San Francisco. Congress headquarters are in the Ring Bldg., Washington.

Sept. 23, American Iron & Steel Institute: Regional technical meeting, Hotel William Penn, Pittsburgh.

Sept. 27-Oct. 2, Society of the Plastics Industry: Third national plastics exposition, Grand Central Palace, New York. Society headquarters are at 295 Madison Ave., New York.

Sept. 28-30, Porcelain Enamel Institute: Institute is one of sponsors of first international congress on porcelain enameling, London. Institute headquarters are at 1010 Vermont Ave., N. W., Washington.

Sept. 28-Oct. 1, Association of Iron & Steel Engineers: Annual convention and exhibition, Public Auditorium, Cleveland. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Cleveland, Cleveland.

Oct. 1-2, Southern Ohio Section of Open Hearth Committee, Iron & Steel Division and Ohio Valley Section, AIME: Annual fall meeting, Deshler-Wallick Hotel, Columbus, O.

Oct. 4-7, Industrial Packaging Engineers Association and University of Illinois: First annual industrial packaging and materials handling short course, Sherman Hotel, Chicago. Association headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 4-11, American Institute of Steel Construction Inc.: Twenty-sixth annual convention, Chateau Frontenac, Quebec, Canada. Institute headquarters are at 101 Park Ave., New York.

Oct. 5-7, Industrial Packaging Engineers Association: Show at Hotel Sherman, Chicago. Association headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 5-7, American Institute of Electrical Engineers: Middle eastern district meeting, Washington. Institute headquarters are at 33 W. 39th St., New York.

Oct. 5-9, Concrete Reinforcing Steel Institute: Twenty-fourth semi-annual meeting, Grove Park Inn, Asheville, N. C. Institute headquarters are at 38 S. Dearborn St., Chicago.

Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

Legislation to legalize basing point pricing may be introduced in 81st Congress should Senator Capehart's committee find small business unduly penalized by mill system

IT IS entirely "conceivable" that Senator Homer E. Capehart's Committee on Trade Policies will formulate legislation for presentation to the 81st congress next year designed to legalize basing point and zone pricing on steel, the metals and finished products, especially if the committee finds that small companies are being unduly penalized by f.o.b. prices. So far, the Senator's mail has brought in only three letters favoring the f.o.b. setup.

While there has been some unfavorable reaction in Washington to the steel industry's shift to f.o.b. mill prices following the Supreme Court's interpretation of the Federal Trade Commission's decision on cement, this is not expected to influence the committee's decisions.

Prohibits Freight Absorption—As will be recalled, the cement case decision, applying only to cement, can be applied to every industry in the United States affected by freight costs. The ruling prohibits absorption of freight by producers as a means of meeting competition with plants located closer to the customer, and applying uniform or "zone" prices to purchases regardless of distances from point of production.

Action taken by the committee will depend in a large measure upon the advice received from an advisory council of 40 producers, processors and consumers of cement, steel, fire brick, tobacco, candy bars, etc., and upon a series of hearings scheduled to start in November.

Budget of $50,000—The Capehart Committee has a budget of only $50,000, of which about $33,000 already has been earmarked for administrative salaries and expenses. So, with the exception of a couple of college professors, the committee selected advisory council members who could pay their own expenses in attending the Washington meetings.

The council includes some very able men in the metalworking field, including Roy Ingersoll (Borg-Warner), Admiral Ben Moreell (Jones & Laughlin), Charles Tyson (John A. Roebling's Sons), James D. Mooney (Willys-Overland), Fred Maytag II, (Maytag Co.), E. Cloud Wampler (Carrier), David Edwards (Saco-Lowell Shops) and H. W. Prentiss (Armstrong Cork).

At the series of meetings to start about Nov. 15, testimony will be taken from users of steel and other materials, government witnesses, economists and the like. While the committee is interested in "everything from candy bars to steel," cement and steel undoubtedly stand at the top of the list.

The study of the impact of the cement case decision is being sparkplugged by an energetic young attorney, William Simon, who is general attorney for the committee and may be reached in Room 138, Senate Office Building.

Await Definite Decisions—Over at the Federal Trade Commission, it may be readily gathered that freight absorption and zone prices are by no means out per se. When Walter B. Wooden, associate general counsel of the FTC, was asked what other industries should do on pricing policies in view of the cement decision, his reply was "sit tight" until definite decisions are handed down for each industry.

For the time being, and perhaps for some time to come, FTC seems to be interesting itself only in definite conspiracies to fix prices and suppress competition as in the case of manufacturers of crown bottle caps and closures a few days ago. Cited were the Crown Manufacturers Association and 12 manufacturers, including Crown Cork & Seal and Armstrong Cork. In effect, FTC said that the industry presented a completely united front insofar as products, prices and terms of sale are concerned. Since 1938, prices had failed to respond to changing conditions of supply and demand and products were completely standardized.

Can Pass Savings Along—This is taken to mean that if a mill could save money in rolling several thousand tons of say 22 gage sheets without roll changes, this saving could be passed along to an automobile or refrigerator maker. All this is suppositional as yet, however, as the cement decision does not affect steel or the nonferrous metals. Most of the latter products, incidentally, still are sold on arbitrary or delivered bases by producers.

Around the FTC, there is the feeling that the steel industry went to f.o.b. mill pricing to force a legislative decision on pricing methods in the next Congress.

Steel Supply Probe Pushed

GEORGE F. MEREDITH, executive director of the Senate Small Business Committee, reports that the committee is digging further into the steel supply situation through a questionnaire now being distributed.

This committee, headed by Senator Kenneth S. Wherry of Nebraska, plans to show the steel industry that it would be to its advantage to supply small steel consumers on a quota basis. Meredith says that the steel industry is not co-operating in trying to treat small users equitably and that it could stop the gray market in steel at a moment's notice.

Looking Into Auto Racket

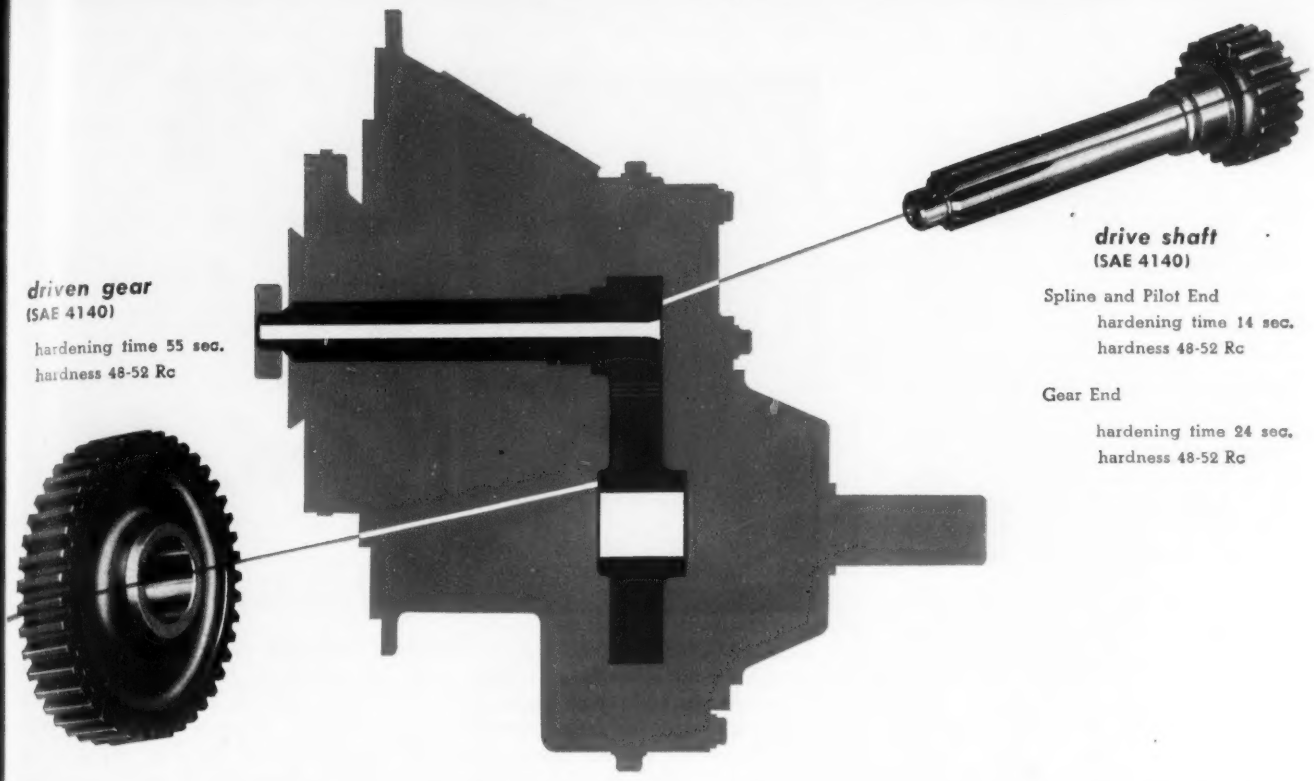
A SPOKESMAN for the Macy subcommittee of the House Public Works Committee says it now is concerned with the current automobile racket in Washington about which it has been getting plenty of complaints. The committee also plans to dig into alleged malpractices in the textile industry which apparently means that further steel gray market investigations have been shelved for a while. No hearings of any kind are on the docket before Sept. 15.

Launch New Scrap Drive Sept. 9

SEPTEMBER 9 has been set as the date for launching the next big drive to bring out dormant scrap. Some 500 trade association executives will be given pep talks by high government officials. Office of Industry Co-operation, which is sponsoring the drive, hopes that industry executives will take a hand prying loose unusable material and equipment.

An OIC man tells a typical story about a pile of steam pipe uncovered in a manufacturing plant in an earlier drive and which the maintenance department insisted must be kept for use in case of a breakdown. A bit of sleuthing by a top executive revealed that the pipe could not be used since the plant long since had changed over to higher pressure steam lines.

In this drive, OIC wants no birdcages and bedsprings from households but figures it can get a lot of agricultural scrap from farmers who have been replacing obsolete equipment, as well as material of good



driven gear
(SAE 4140)

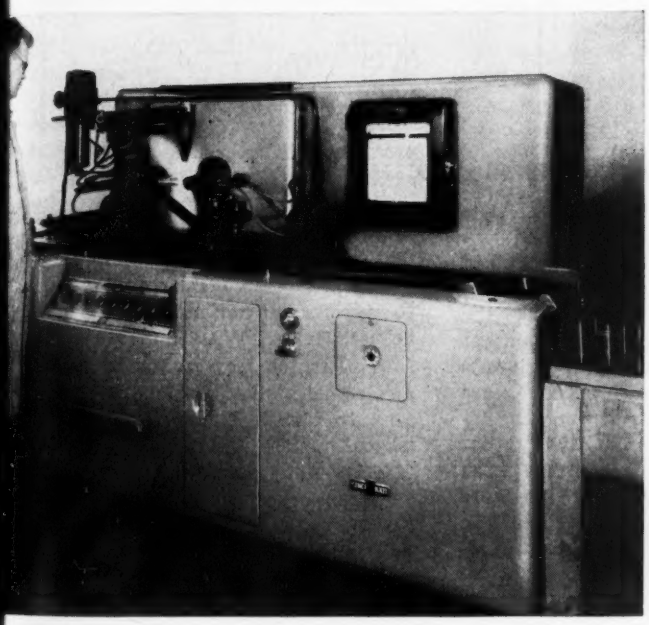
hardening time 55 sec.
hardness 48-52 Rc

drive shaft
(SAE 4140)

Spline and Pilot End
hardening time 14 sec.
hardness 48-52 Rc

Gear End
hardening time 24 sec.
hardness 48-52 Rc

Rockford Clutch saves 5 ways with flamatic hardening



ending

If you harden gears up to 12" diameter, shafts up to 20" long, write for Flamatic Catalog (Publication M-1611) and see how much Flamatic surface hardening can save for you.

Low capital investment, low operating costs, application to wide range of parts, quick setups for short run economy, and ability to duplicate exact desired results, part after part, run after run – these are the chief reasons that Rockford Clutch Division, Borg Warner Corp. has found the Cincinnati Flamatic Hardening Machine so profitable.

Take the drive shaft and gear shown above, for instance: From scratch, operator easily positions flame heads, puts work holding fixture on spindle, presets desired "release" temperature, sets master switch on "automatic" and is ready to run. Operator loads the machine, presses button. High temperature flames heat surface to within plus or minus 5°F of preset value, at which instant the electronic control stops flames, piece is automatically deposited in oil quench. Distortion: negligible. Subsequent machining: none. And Rockford reports **no failures** of any parts processed on the Flamatic.

THE CINCINNATI
flamatic
HARDENING MACHINE

CINCINNATI

THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO, U.S.A.

quality from industry and the railroads.

Last week, the first cargo of scrap arrived from Germany under a new program which promises to provide between 50,000 and 60,000 tons a month. It included both heavy breakable cast and steel grades. Purchases are negotiated directly between American and German dealers at $26 to $29 a ton, f.a.s. Bremerhaven.

Reserve Board Studies Prospects

SEVERAL months ago, Thomas B. McCabe, chairman of the Federal Reserve Board, said that we are walking a tightrope with inflation on one side and deflation on the other. He saw no recession for the balance of 1948.

In order to get a clearer picture of what may lie ahead in the coming year, the Board's researchers now are making an even more "intensive" study of business prospects than usual. It will be ready in about six weeks for the guidance of the board and its member banks.

In the meantime, some of the board's prognosticators see no slump ahead either for the balance of 1948 or 1949. At the same time, tightening of credit authorized by the special session of congress "will not do much good" in slowing down inflation. Reserve requirements are being increased four percentage points to 28 per cent for central reserve cities (New York and Chicago), to 24 per cent for other reserve city banks and to 14 per cent for country banks.

Industrial production tended downward in June and July, due to material shortages in some industries, including steel, and slackening of demand in others.

Industry Urged To Train Men

ANY number of government officials make the plea to get the word back to industry that it should train men for government service in time of emergency in its own best self-interest. It is pointed out that industry will get a better deal if its affairs are handled by men who understand its problems. Right now, ECA needs trade and industrial experts but has plenty of other workers.

Coast Shipyards Bog Down

AT A hearing in Seattle Col. Joseph K. Carson, member of the Maritime Commission, conferred with the shipping industry at which it was developed there is little likelihood of West Coast shipyards participating in the government's new shipbuilding program.

SEEK ATOMIC POWER FOR PLANES: Nuclear energy for aircraft would permit virtually unlimited range, according to Andrew Kalitinsky (wearing glasses), chief engineer of Fairchild Engine & Airplane Corp.'s nuclear energy for propulsion of aircraft division. Such a plane would be able to fly around the world without refueling and the fuel required for such a flight would weigh almost nothing. Kalitinsky is shown conferring with his assistants at Oak Ridge, Tenn. NEA photo

Yards on the Pacific Coast are handicapped by freight rates on materials from eastern mills. Formerly they were allowed a 7 per cent differential which is no longer permitted.

Fear of War Appears Mounting

MANY government people feel that a war with Russia can happen any time now—a view shared by many in industry. The smaller fry among Russian nationals are leaving the United States, which is reminiscent of the way the Japs left prior to Pearl Harbor. Washington hears that Mongolian troops are moving into the Russian zone of Germany, that production of war goods has been stepped up to fever pitch, and fears that Western Europe could be grabbed practically overnight. It also is felt that the Russians might decide to sit tight if they manage to grab Western Europe.

Retroactive Discounts Out

THE FEDERAL Trade Commission has decided that retroactive discount plans violate the Robinson-Patman Anti-Discrimination Act. The Jacques Kreisler Mfg. Co., North Bergen, N. J., has been giving customers discounts based upon purchases during a calendar year. These ranged from 2½ per cent on annual purchases of $500 to 25 per cent on purchases over $15,000. Such discounts now are prohibited.

Miscellany

W. A. "BILL" Hauck, who masterminded the wartime steel expansion program and later disposed of most of the government-financed plants for the War Assets Administration, is back in Washington (Room 418, Roger Smith Hotel) after a well-earned vacation. He is considering plans for the future, but has none to announce as yet. He left WAA June 30 before Administrator Jess Larson leased the government blast furnace at Cleveland to Kaiser-Frazer . . . For the second month (June) since the Taft-Hartley Act became law a year ago, the number of cases pending before the National Labor Relations Board has been reduced—but 12,700 cases were still on the docket June 30 . . . Washington continues to hear reports about a big new steel plant for the East Coast, which has been variously located in northern New Jersey, Providence and more recently on the Delaware River . . . Argentine State Railways takes bids on 32 motor coaches Sept. 14, on 42 diesel trains Sept. 17 . . . OIC reports being still plagued by people wanting steel, one of the latest being for steel for mop handles . . . OIC can entertain only essential industry programs, yet the record shows that a number of private firms have been aided—voluntarily.

Price Lid Holds—Uneasily

Rising costs put steam behind German steelmen's requests for higher prices

DUSSELDORF, GERMANY

AUTHORITIES are steering clear of the thorny problem of German steel prices. Yet costs of Swedish ore, coal and power continue to mount, contributing to a financial tangle which may become a hopeless snarl if nothing is done.

Consensus is that an increase of $1.25 per metric ton on rolled steel products is necessary. If this increase is authorized, steel bars, for example, would cost $76.20 per metric ton. Should this action be taken, however, these higher quotations would boost German prices above those for the rest of western Europe, thus minimizing exports which are also considered of prime importance.

Export Climb—Incidentally, the export trade in machinery and such steel products as barbed wire is slowly mounting. Production generally is inching upward, and with this improvement has come greater pressure for higher steel allocations. The automotive industry is particularly insistent. During the first six months of this year the industry was alloted steel for replacement parts production only, but managed some output of new cars by using stocks on hand. The industry claims its share of the total steel should be at least 5 or 6 per cent. In the first six months of this year, it obtained only 1.7 per cent.

The improved production record has led some industrialists to entertain hopes that financial assistance from private capital in the United States may be possible. ECA Administrator Paul Hoffman's action in halting the dismantling of a German freight car building plant is also seen as a sign of a more hospitable American attitude toward German industrial resurgence. Consensus, however, is that financial aid from the United States is far off and that those who desperately nurse such hopes are only trying to grasp at straws.

French Heartened by 1948 Pace

FRENCH economic situation at the end of the first half of this year shows a heartening improvement, with industrial production 10 per cent higher than in the same period in 1947.

One factor, which eventually will have a strong bearing on the industrial situation, is the birth rate which has a surplus of 300,000 over the death rate for the half year, greatest difference in French history.

Coal output, however, is only 3 per cent more for the half year, compared with the corresponding period of 1947. June's coal production was 4 per cent higher than in May, rising to 103 per cent of the 1938 monthly average. During the first six months total coal output was 25,877,000 tons and imports aggregated 8,972,000 tons including those received from the Saar. Of the total imports, 4,686,000 tons, or 52 per cent, were received from the United States.

During the six-month period, a slight improvement in France's trade balance was also noted, with exports from France to her overseas territories being credited for most of the improvement.

Ferrous Output Rises—During the first six months production of raw steel amounted to 3,588,000 tons against 2,907,000 tons in the like 1947 period. Output of pig iron, at 3,135,000 tons, was equivalent to 105 per cent of 1938 output and 31 per cent more than in the like period of 1947. Iron ore production amounted to 11,470,000 tons, or 70 per cent of the 1938 half-year output. Pig iron and crude steel production in June was at about the same level as May, although a slight increase in output of hot-rolled steel was noted. During the latest month 91 blast furnaces were in operation, compared with 66 a year ago.

Production of automobilies and trucks has reached a new record. Relative to the 1938 monthly average, commerical vehicle production was more than double, the index standing at 234; the passenger car production index, however, was at 59 per cent of the base. During, the period January-June, 47,717 passenger cars and 50,707 trucks were produced.

Britain To Train Foundrymen

BRITAIN'S battle for increased production continues on all fronts, with one of the latest moves being a drive for improved technological methods in the foundry industry.

A training center in the West Midlands has been established by the West Midland Foundry Advisory Committee at the works of Rudge-Littley Ltd., iron founders of West Bromwich. This is the first of a series of such centers planned for the entire country. Short courses in modern methods of foundry practice will be given and trainees will have facilities for instruction in the production of light, medium and heavy iron and nonferrous castings.

The blueprint stage has been reached in the project to increase Britain's electric generating capacity, although actual construction of generating units is still a long way off. The coal industry's plans for mechanization, however, are nearer realization. Some orders for equipment have already been placed, and allocations for the steel have been secured. Steel allocations, incidentally, appear to have become a permanent feature of the nation's economy since no balance between supply and demand is in sight.

Automakers and shipbuilders are currently applying the heaviest pressure for increased allocations, but steel producers reply that they are operating at virtual maximum capacity now and higher production is unlikely. Major curtailing factor in steel output is shortage of scrap. While domestic scrap collections were excellent during the first half of this year, imports have fallen.

Belgian Exports, Output Rise

BELGIAN exports of machinery, equipment and steel products continue to mount, and the nation is unique in that its steel supply almost balances domestic demand. Virtually the only product still difficult to obtain in the home market is thin plates.

Steel production during the first six months showed steady improvement, with the exception of June when a strike dropped ingot and casting output to 235,800 metric tons, compared with 306,350 tons in May. Coal production continues at satisfactory levels with 89,000 tons mined per week during June. During the month only 177,000 tons were imported, 136,200 tons of which were German high quality coking coal.

Belgian exports during the first half of this year showed considerable improvement over shipments during the corresponding period of 1947 with every country but Denmark. The nation deals with the following countries, listed according to relative volume of business: Holland, France, Great Britain, Switzerland, United States, Germany, Belgian Congo, Argentina, Denmark, Brazil, Egypt and Canada.

United States steel price increases earlier in the summer gave Belgian producers the opportunity to take some business away from American manufacturers. Belgian prices in many instances are still not competitive, but better deliveries can be given. The improved export picture, however, has its drawbacks as most of Belgium's customers owe money to the nation's producers. Many look to the Marshall Plan to straighten out the financial tangle.

Barge Steel Shipments Limited

Only small proportion of total steel movement handled via barge or truck but possibilities for increasing tonnage are being studied. Most steel consumers specify "ship as usual"

PITTSBURGH

STEEL producers are reviewing factors for and against expenditure of large sums which would be necessary to augment shipping facilities, should the indicated gradual increase in movement of steel via barge and truck materialize. There are no indications, however, a decision on this matter will be reached in the near future.

Success or failure of industry's effort to obtain congressional sanction to meet competitors' prices on shipments into major steel consuming areas will largely determine the extent truck and barge shipments will be utilized in meeting future competitive conditions.

Early Change Unlikely—Regardless of final decision on steel pricing, transportation by barge or truck is not expected to displace railroad shipments to any significant extent until supply and demand is in better balance.

Despite industry's current policy of quoting products at the mill, with resultant higher freight costs for many consumers, plus sharp increase in rail freight rates in recent months, steel producers report little change in the long standing pattern of tonnage moved by rail, truck or barge.

Small Proportion — Volume of steel delivered via barge or truck represents only a small proportion of overall shipments. One large producer, even though favorably located as to river transportation, is shipping less than 9 per cent of its output by barge.

Shortage of steel barges is an important factor that would prevent early surge in movement of steel via inland waterways. Barge manufacturers' deliveries are extended 6 to 8 months. However, given adequate steel supply, this situation could be promptly remedied to meet a reasonable increase in barge requirements. River locks or terminal facilities for handling increased barge traffic are not likely to present a formidable problem. Modern tow boats are capable of handling bulk shipments representing 300 full railway cars in a single tow, and at substantially greater speed than formerly.

Steel producers report a flurry of inquiries from customers seeking information covering transportation charges. A number of metalworking companies also have taken steps to review product classifications in relation to freight rate status in an effort to keep shipping costs at a minimum. Such studies have resulted in considerable savings in some instances. Similarly, savings have been realized by relocation of fabricating activities to point of end-product assembly, thus obtaining lower freight rates on inter-plant shipment of semifinished items.

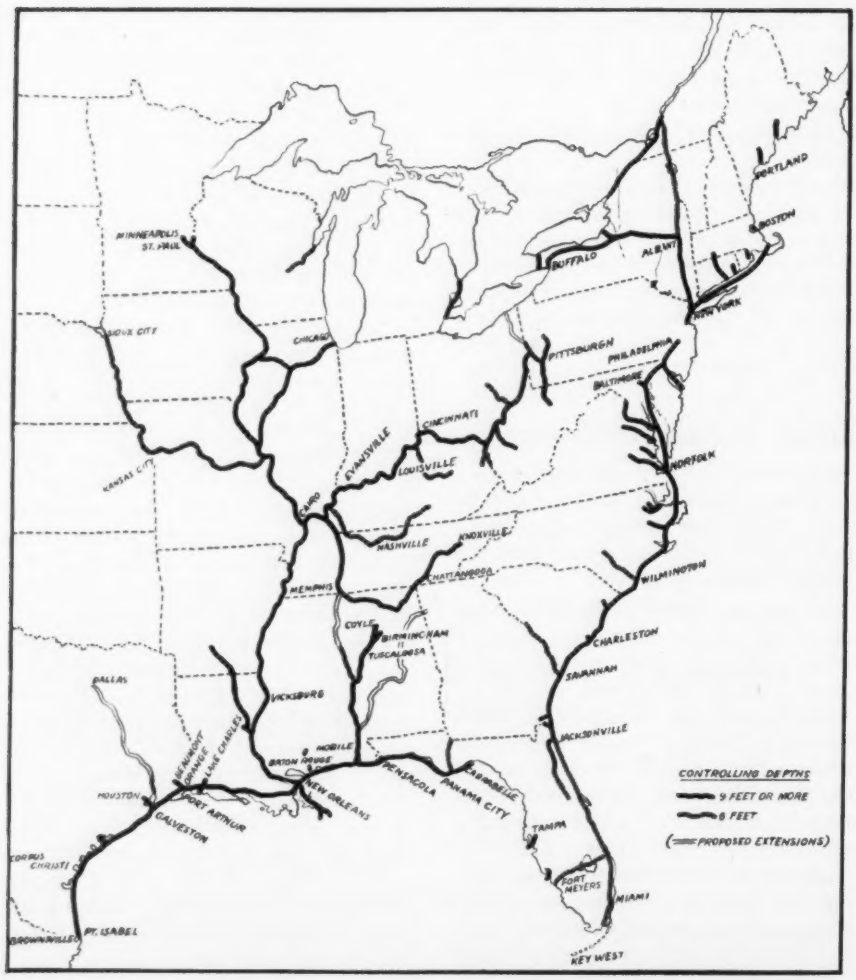
Rail Rates Up — Increase of slightly over 50 per cent in rail freight rates since Jan. 1, 1947, in contrast to 6 per cent via barge is prompting metalworking companies to seek information regarding lowest combination freight charges. This has been accentuated by adoption of mill pricing.

Majority of steel consumers are expected to continue to specify "ship as usual" so long as the tempo of industrial activity remains at the present high level and until operating schedules are no longer adversely affected by unbalanced or depleted inventories. The longer time element on barge shipments is a major factor in today's tight steel supply market. So long as this situation exists, relatively little consideration is expected to be given the comparatively slower, although cheaper barge transportation. However, in a more competitive period, both consumers and producers would logically utilize the cheapest form of transportation.

Revamp Facilities — This would necessitate considerable revamping of plant facilities for handling of incoming and outgoing shipments either by truck or barge. Such also would involve establishment of sufficient storage space in key steel centers on inland waterways for assembly of barge lots which normally involve minimum shipments of 500 tons. This is one of the major reasons behind a proposed rail-truck-barge terminal in Pittsburgh.

Steel consumers' orders normally

INDUSTRY EXAMINES INLAND AND COASTAL WATER ROUTES



PRODUCERS LIKE J & L SEE BARGES AS EVENTUAL ANTIDOTE TO HIGH RAIL FREIGHT COSTS

are well below 500 tons for a specific item, which would naturally complicate the job of assembling total product requirements from various mills via rail and truck for shipment by barge. There is also the problem of co-ordinating barge shipments with mill rolling schedules, all of which would appear to point up the overall advantage of a central terminal port for assembly of barge shipments.

Adequate Warehouse Facilities — Those steel producers located on inland waterways could with relative ease revamp dock facilities for handling substantially more barge tonnage. Mills' barge handling facilities are tied up somewhat by bulk shipments of limestone, coal and scrap. Similarly, relatively little difficulty is anticipated by metalworking companies located on the rivers. Most river ports have adequate terminal warehouses for handling increased river traffic.

Relatively few steel producers and metalworking companies not located near rivers have adequate facilities for handling a substantial increase in steel shipments via truck or by rail for barge lots. However, this situation could be remedied.

Perhaps indicative of the trend toward speeding up steel shipment by truck is the recently completed expansion of Jones & Laughlin Steel Corp.'s facilities for handling cold-finished steel. Present equipment can load eight trucks from overhead cranes simultaneously. Arrangement of loading platform in driveways provides for a continuous flow of traffic.

Study Terminal Proposal — Survey of barge loading facilities around Pittsburgh, specifically along the Ohio to Colonna, up the Monongahela to Glassport, and up the Allegheny River to New Kensington, indicates there are no combination warehouse and barge loading facilities for large scale forwarding of freight in barge lots. This has prompted investigation into the economic and commercial advantages to the Pittsburgh area of a proposed rail-water-truck terminal and warehouse. While such facilities are not now readily available, there is nothing to indicate necessary loading equipment and property for a storage terminal could not be obtained.

American Barge Line Co. has put into effect its previously seldom used carload freight rate schedule from Pittsburgh to Memphis and New Orleans, ranging from 9 to 14 cents per 100 pounds. Such a rate structure is to the advantage of steel consumers whose requirements normally are well below the 500 tons minimum rate. Even when steel shipment is handled part of the way by rail, the additional cost on the rail portion is absorbed by the barge company in the overall rate given the purchaser. Other barge lines could undoubtedly obtain similar carload rates through the Interstate Commerce Commission if it were thought advisable.

General economies possible with barge shipments are illustrated in the accompanying table. It will be noted such savings are reduced considerably on shipments to inland points through the various river ports.

GE's Reed Named to CED Post

PHILIP D. REED, chairman of the board of General Electric Co., has been elected chairman of the Research & Policy Committee of the Committee for Economic Development. In this capacity he will direct the research activities of this organization, succeeding Raymond Rubicam whose term has expired.

In announcing a new research program, Mr. Reed listed the following topics on which his group will report over the coming months.

1. Safeguards against extremes of economic instability with emphasis on fiscal and monetary policy to combat inflation and deflation.
2. How to raise real wages.
3. Federal tax policy for 1949.
4. International economic readjustment.
5. Allocation of resources in a defense economy.
6. How to keep economic and individual freedoms in a garrison state.

BARGELOAD RATES ON IRON AND STEEL PRODUCTS—EXCLUDING PIPE RATES IN CENTS PER 100 POUNDS‡

	Switching Charge at Pgh.	Transfer Charge at Pgh.	Wharfage or Toll	Barge Rate	Port Transfer at Dest.	Switch or Line Haul	All Rail Rate	Total Rail-Water Rate	All† Rail per C/L	Rail-Water† per C/L	Estimated Savings†
Houston	4.8	3.75	1.4	37.1	5.5	1.7	96.0*	54.25	806.40	455.70	350.70
Fort Worth via Houston ..	4.8	3.75	1.4	37.1	5.5	65.0	125.00	117.55	1050.00	987.42	62.58
San Antonio via Houston ..	4.8	3.75	1.4	37.1	5.5	59.0	140.0	111.55	1176.00	937.02	238.98
Austin, Tex. via Houston ..	4.8	3.75	1.4	37.1	5.5	53.0	131.0	105.55	1100.40	886.62	213.78
New Orleans ...	4.8	3.75	0.75	27.6	4.0	2.56	94.0	43.46	789.60	365.06	424.54
Gulfport via New Orleans	4.8	3.75	0.75	27.6	4.0	23.0	94.0	63.90	789.60	536.76	252.84
Memphis	4.8	3.75	..	16.5	4.0	1.59	84.0	30.64	705.60	257.38	448.22
Tulsa, Okla. via Memphis .	4.8	3.75	..	16.5	4.0	80.0	110.0	109.05	924.00	916.02	7.98
McAlister, Okla. via Memphis .	4.8	3.75	..	16.5	4.0	77.0	114.0	106.05	957.60	890.82	67.78
St. Louis	4.8	3.75	..	19.4	6.0	2.26	56.0	36.21	470.40	304.16	166.24
Evansville	4.8	3.75	..	12.4	5.0	2.86	62.0	28.81	520.80	242.00	278.80
Cincinnati	4.8	3.75	..	7.4	5.0	2.03	46.0	22.98	386.40	193.03	193.37

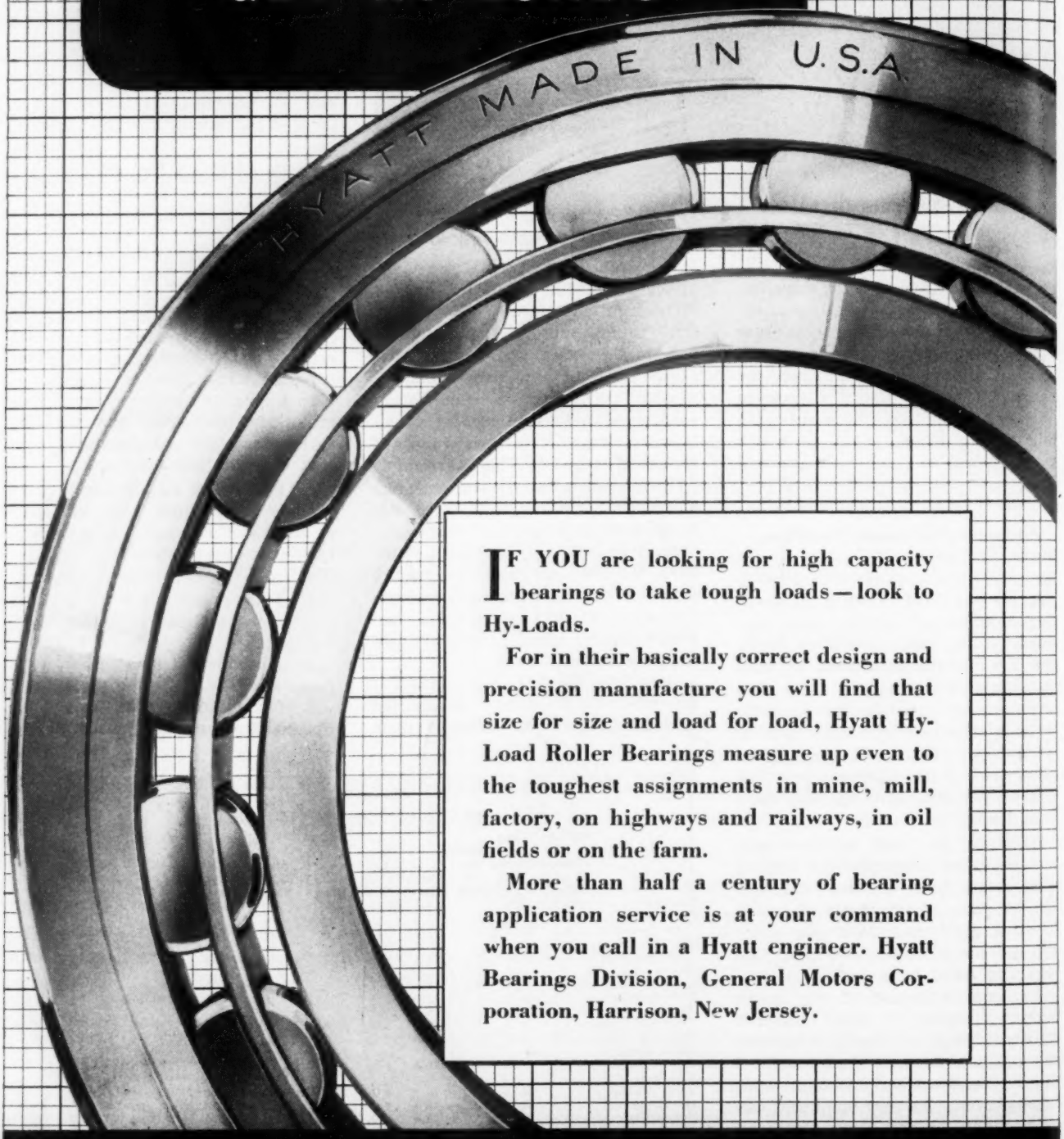
‡ For 84,000 pound carloads from Pittsburgh district, using rates that would apply over proposed Pittsburgh port. Barge rates based on 500-ton minimum.

† Carload charges and savings in dollars.

* Depressed rate due to water competition.

(Source: Charles Donley & Associates)

FOR TOUGH LOADS GET HY-LOADS



IF YOU are looking for high capacity bearings to take tough loads—look to Hy-Loads.

For in their basically correct design and precision manufacture you will find that size for size and load for load, Hyatt Hy-Load Roller Bearings measure up even to the toughest assignments in mine, mill, factory, on highways and railways, in oil fields or on the farm.

More than half a century of bearing application service is at your command when you call in a Hyatt engineer. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Newspapermen get first glimpse of "sky-lounge" styling of 1949 Nash models. Formal announcement scheduled for October. Wraps also taken off new Kaiser-Frazer line

DETROIT

FIRST glimpse of the "sky-lounge" styling of 1949 Nash models was accorded the Detroit press contingent last Thursday at the Bloomfield Hills Country Club. They were apparently handbuilt versions of the new line, since the company's plants in Racine and Kenosha, Wis., will not be in full production until after Labor Day.

Assemblies of 1948s ended July 31 and totaled approximately 87,000 units, comparing with 67,000 during the same period of the previous year. Extensive plant changes have been under way this month, all a part of the company's $40 million postwar expansion and modernization program scheduled for completion within the next year.

Model Change on Schedule—Tools and dies for the 1949 Nash series have been ready for quite awhile and the model change has proceeded on schedule, without any difficulties being experienced from the strike in Detroit-area tool shops.

There is room for speculation over whether Nash may have been able to follow the design and styling trends established in the current Ford and Hudson models, in view of the fact tooling was completed before these cars appeared. However, it is certain that a sharp deviation will be registered from the appearance of 1948 models.

Further showings of the new 600 and Ambassador lines will be held around the country during September, and formal announcement is scheduled for October, by which time most dealers will have a fairly good sampling of cars. Meanwhile, the extended plant shutdown during August has given ample time to build up good inventories of parts and raw materials, avoiding many of the materials headaches which have plagued other manufacturers for the past two months. A flying start on assemblies should be possible next week. Castings, sheet metal components, axles and other subassemblies requiring extra lead time have been under way for several weeks. Daily capacity of the Wisconsin plants has been on the order of 700 units, a figure which will be boosted to around 1100 by next year if current planning materializes.

Kaiser-Frazer Line Unwrapped

WRAPS are to be taken off the complete Kaiser-Frazer line of passenger cars today at the K-F Willow Run hangar, with national distributors in attendance. Top officials of the company will be in attendance after a hectic week of shuttling about the country in connection with conferences and committee hearings in connection with the Cleveland blast furnace negotiations.

The showing is about a month late because of delays incident to the receipt of new tooling. It had been planned to hold the display the latter part of July, in fact the front ends of the 1949 Kaiser and Frazer models were reproduced in color in the August issue of *Fortune*, by accident it turns out, since at the time the photographs were released for publication it was believed the cars would have been shown publicly. They weren't but it was too late to recall the pictures.

Minor Changes—Changes in the K-F line are relatively minor in degree, confined principally to refinement of styling details, trim, grilles and rear-deck treatment. An obvious effort has been made to step up the smartness and sparkle, to make the cars look like more for the money.

Models to be introduced to the public next month include only the Kaiser Special and Kaiser Deluxe. After that will come a new 4-door convertible, a second model which is described only as a "hardtop" and apparently something brand new for the industry, the Frazer and the Frazer Manhattan. Development of 2-door K-F body types has been deferred for the present.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	422,324	366,205
February	399,460	393,636
March	519,133	443,588
April	462,315	445,137
May	359,989	404,191
June	454,388	421,466
6 mos.	2,617,609	2,474,223
July	487,766	399,456
August		364,478
September		444,501
October		461,536
November		417,493
December		492,109
12 mos.		5,055,284
Estimates for week ended:		
Aug. 7	108,864	79,452
Aug. 14	112,342	83,501
Aug. 21	113,847	84,726
Aug. 28	110,000	88,098

Estimates by Ward's Automotive Reports

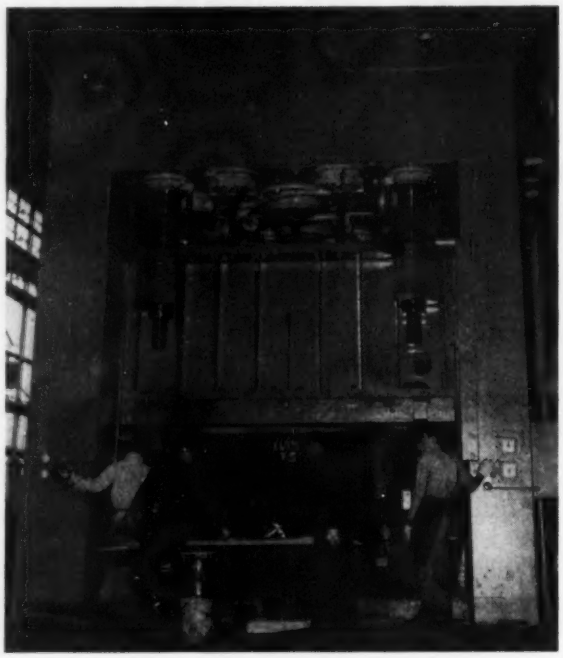
Turning to Steel Camshafts

FORGING of steel camshafts for automobile engines has sprung up in several quarters as the aftermath of the protracted shutoff of cast iron shafts from the Muskegon foundry source (see page 28). Oldsmobile has begun forging some shafts at its Lansing forge shop and Chrysler evidently brushed the dust off some camshaft dies at its Dodge Forge Division and pressed them into service. Oldsmobile also is understood to have purchased some forged steel shafts from Muskegon Motor Specialties Co. Meanwhile, at the Ford production foundry several hundred new men have been hired to get production started on cast camshafts for the Lincoln V-8, the Ford 6 and the Ford tractor engines, in addition to cylinder blocks for the Lincoln. The job will work two shifts in the effort to turn out 250 blocks daily, about half Lincoln's requirements.

Packard Plans Capital Change

PACKARD directors may take action shortly to present to stockholders a plan for changes in the capital structure of the company aimed at reducing the present 15 million shares to either 3 million or 5 million. The move is twofold in purpose, first, the public relations angle, to bring per-share earnings more into conformance with those reported by other auto companies, and second, to reduce the excessive amount of clerical ef-

(Material in this department is protected by copyright and its use in any form without permission is prohibited)



1400 TONS OF POWER: This press is the pride of Willys-Overland Motors recently completed stamping shop at Toledo. The 1400-ton triple action unit heads the first line of presses, is used to stamp bodies and parts for the various Jeep models

fort involved in handling registrations and transfers on such a large number of shares.

Earnings per share for the first half of the year were 41 cents. If the stock should be exchanged on a 1 for 3 or 1 for 5 basis, these earnings would be raised to either $1.23 or $2.05, believed to be more respectable in the light of today's circumstances. Packard common was split up back in 1929 on a 5 for 1 exchange when it was selling at around $160. The new quotation of $32 held for a time then declined steadily to less than $10, where it has vacillated for a number of years, currently being less than $5. The company's 118,000 shareholders will have to vote acceptance or rejection of any new plan for exchange.

Plans Automatic Transmission

EQUIPMENT and personnel are gradually being organized for the new Packard automatic transmission department, and building space of around 1,800,000 sq ft has been allocated to the division. Technical details of the unit are still being kept secret and there is not likely to be any production started before next year. Best opinion is that the device is the torque-converter type of transmission, providing the equivalent of infinitely variable gear ratio.

Start on Second 100 Millionth

THE 100,000,000th vehicle built by the automotive industry since the start of production half a century ago popped off some unindentified assembly line recently, with earlier plans for its commemoration either junked or deferred. August is a poor month for elaborate ceremonies anyway, and a more propitious occasion may develop later in the year.

Looking ahead to the next 100 million, the industry can confidently expect its realization in half the time required for the first, perhaps even within the next 20 years.

General Motors Adjusts Wages

GENERAL Motors' average hourly wage rate jumps another 3 cents as of Sept. 1, in accordance with the corporation's current cost-of-living wage adjustment formula, affecting 265,000 hourly rated employees. This brings the GM average rate to $1.595 per hour, comparing with $.941 per hour average in January, 1941, an increase of 70 per cent.

Approximately 68,000 salaried employees will get a $25 increase during September, representing the cost-of-living adjustments for the preceding three months. During December, eligible salaried employees will receive an additional $15 or a total of $40 as an adjustment for the period Sept. 1-Dec. 1.

Under the formula, wages and salaries in General Motors, except for salaried personnel in the so-called "bonus group," are adjusted quarterly in line with the increase or decrease in the consumer price index of the Bureau of Labor Statistics. The BLS index for July 15 was 173.7, comparing with 169.3 for April 15 of this year, an advance of 4.4 points. The next adjustment will be made Dec. 1, based on the BLS index for Oct. 15.

Chrysler Ups Auto Prices Again

CHRYSLER Corp. has increased prices of its various lines of passenger cars an average of slightly less than 5 per cent. This is the second upward revision in two months. In June the company boosted prices an average of about 6 per cent. Company said the new increases were the result of recent mark-ups in prices it has to pay for basic materials, transportation and other items.

Oil Prices Remain Steady

DESPITE rumors of price decreases in industrial fuel oil, such is the case in only a few scattered instances where refiners have "distress" oil on their hands.

"Distress" oil results from a seasonal slackening in demand. Refiners, faced with high production but inadequate storage space, are in a few instances cutting prices because a customer cannot accept delivery due to a shutdown from a strike or repairs to plant storage facilities.

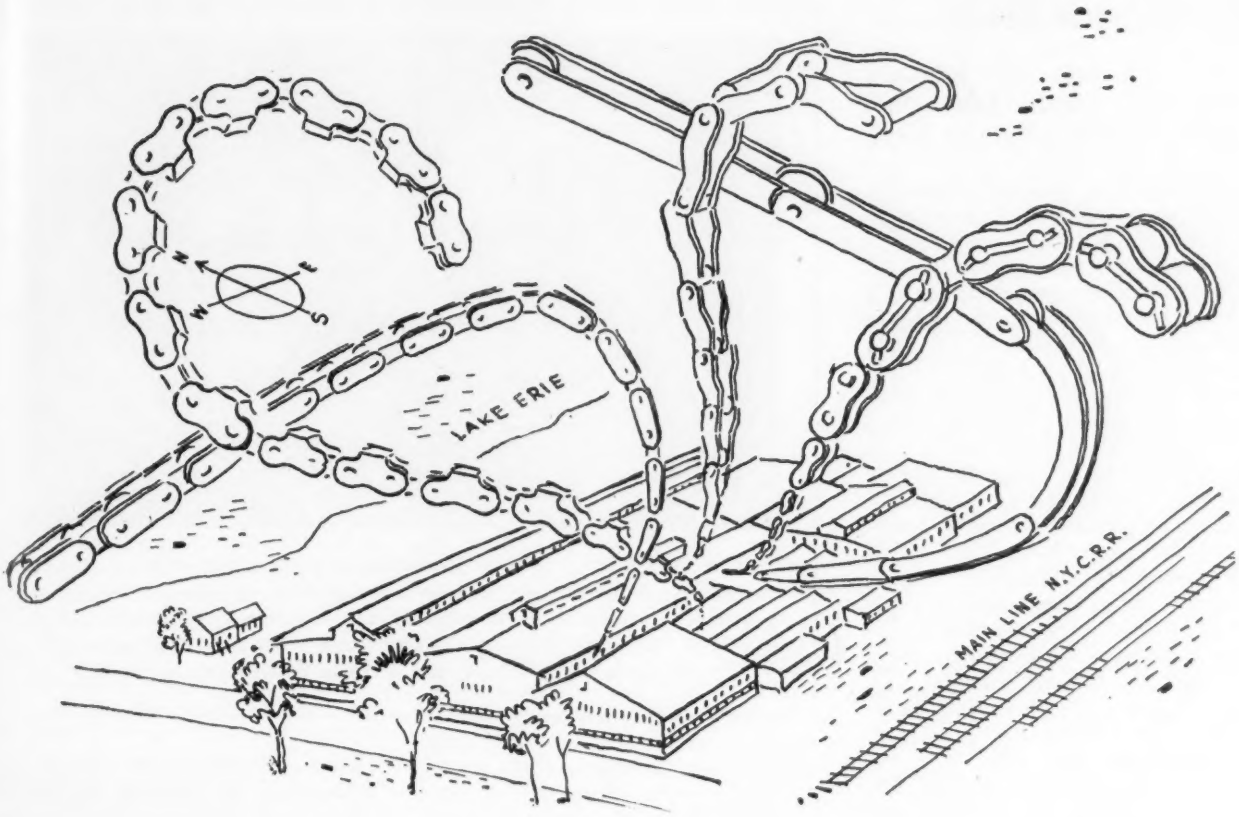
The distress situation applies chiefly to heavy grades, while with light qualities plants are taking all they can get. On the East Coast, where supplies are always tightest, prices for the light grades have gone up 0.2 cent per gallon. Prices generally, however, have varied only slightly in recent weeks. Consensus is that there will be no more price increases in fuel oil.

Supply for winter is expected to be slightly better than last season.

Quarterly Oil Quota Up Slightly

QUOTAS for exports of petroleum products for the third quarter of 1948 have been announced by the Department of Commerce through its Office of International Trade.

Total third-quarter quota for all petroleum products is 14,575,000 barrels which is 676,000 barrels greater than the corresponding quota for second quarter. Increase is accounted for largely because of greater allotments to Curacao in the Netherlands West Indies, which is producing a special fuel oil for the U. S. Navy, and to the Gander airport in Newfoundland, which is on the main air route from North America to Europe. Aside from these and a few other increases, most quotas remain essentially the same as they were in the second quarter.



What's Interesting About UNION CHAIN'S Plant?

Union Chains for Every Application

Drive and Conveying Chains and Sprockets
- Bridge Chain
- Combination Malleable Iron and Steel Chain
- HB (hardened bearing) type chain
- BP (bar and pin) type chain

★

Finished Steel Roller Chains and Sprockets
- All manufacturer's standard, size ⅜ in. to 2½ in. pitch
- Single and Multiple Strands
- Extended Pitch Series in sizes 1¼ in. to 4 in. pitch

★

Silent Chain and Sprockets
- All sizes ⅜ in. to 1½ in. pitch

★

Flexible Couplings
- Roller chain type
- Silent chain type

Principally that it was built for the express purpose of manufacturing all types of Steel Sprocket Chains, Accessory Attachments, and . . . nothing else.

This distinction, however unusual in the chain industry, is of no consequence unless it means something to you as a user of chain. We believe that it does because it provides the twin benefits of economy and high quality resulting from specialization. Union's plant is a modern, one floor, straight line layout, which receives raw materials at one end and ships finished chain from the other in quantities which are constantly increasing.

If some of Union Chain's production is not already "tagged" for you, plan with us now for the day when it will be.

The Union Chain and Manufacturing Company

TRANSMIT POWER
UNION CHAINS
CONVEY MATERIALS

Sandusky, Ohio, U.S.A.

Westinghouse Booms

New unit near San Francisco may soon produce $40 million worth of electrical goods yearly

PARALLELING western industrial expansion is production growth at Westinghouse Electric Corp.'s Sunnyvale plant near San Francisco.

The division is now producing at a rate of $30 million a year, and in 1949 output is expected to reach $40 million. Housed in facilities established by the Joshua Hendy Iron Works and leased to Westinghouse, the Sunnyvale plant is the largest electrical manufacturing facility in the West. Westinghouse incidentally, is expected soon to exercise an option to buy the property.

Produced War Materiel — During the war Joshua Hendy used the unit for the manufacture of turbines, torpedo tubes and other war materiel, but since the present occupant took over in March, 1947, motors, transformers, turbines, switch gear, control apparatus and other electrical equipment have been turned out. The market served by the plant extends westward from Salt Lake City and also includes Mexico, other Latin American countries and the Orient, as well as Pacific areas.

The Sunnyvale plant now employs nearly 2000 persons and new workers are being added at the rate of 150 a month. By the end of 1949 the unit expects to have 4000 on its payroll.

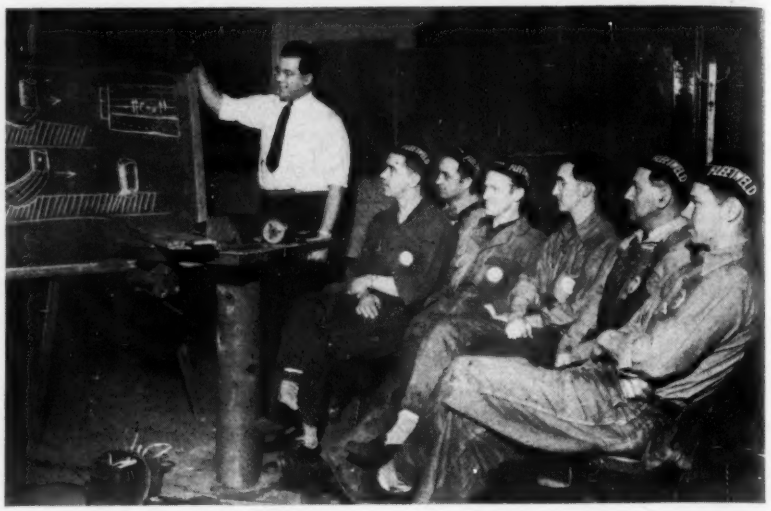
Approximately 70 per cent of the steel used by Westinghouse at Sunnyvale is obtained from the Geneva plant in Utah and the Fontana mill in southern California.

Texas Construction Slows Down

COMMERCIAL construction in the Dallas, Tex., area has apparently reached the peak of the postwar feverishness during which it seems to have been the rule to build-at-any-price, leaders of labor and contractors' organizations declare.

R. B. James, AFL's Dallas Building Trades Council, and A. C. VanBuskirk, president, Dallas County Construction Employers' Association, are quoted as agreeing the trend in commercial building has turned downward toward normal volume. Both based opinion on a downward trend in employment in the commercial construction segment of the building trades, and also a drop in immediate future planning for new construction.

Both hastened to point out, however, that "in no sense is commercial building in the Southwest at an end. The volume reduction simply means that industry is settling itself down to a normal and yet strong volume." They emphasized that the Southwest has outstripped most parts of the country in commercial and industrial building since the war's end and there is still a great deal of expansion in the immediate future.



"SKULL SESSION": Lincoln Electric Co. is authorizing service and repair organizations to become field service shops for Lincoln and is training personnel for such shops in a school at the company's Cleveland headquarters. Shown is Training Director Robert Wilson instructing a group of pupils in the theory and practice of Lincoln equipment

Stanford Research Expands

EXPANDING West Coast industry and widening horizons of research have led to the rapid development of Stanford Research Institute, founded in November, 1946, as the applied research center for the West.

The organization was founded at the suggestion of a group of Pacific Coast industrial leaders as an affiliate of Stanford University, Stanford, Calif. Today it has a staff of more than 125 engaged in research and development activities for industry and government in 22 different fields of science and industrial economics.

Kropp Acquires Surplus Plant

SALE of a government-owned forging plant at 1339 South 54th street, Cicero, Ill., to Kropp Forge Co., wartime operator, for $755,000 has been approved by the War Assets Administration.

The Kropp company, which has been using a portion of the plant since the war, plans to spend approximately $500,000 in rehabilitation work and, when in full operation, expects to employ 350 workers.

The facility will be used for production of automotive, tractor, and other large forgings as well as aircraft parts for the Navy. It consists of a nine-acre site and eight buildings with a total floor area of 80,000 square feet. It was built at a cost of approximately $2,500,000.

Car Builder's Costs Incur Loss

RISING production costs were the major cause for the $666,493 loss incurred during the first six months of this year by Pressed Steel Car Co. Inc., Pittsburgh, according to John I. Snyder Jr., chairman of the board.

Mr. Snyder points out that much of the trouble lies with orders booked in 1947 at prices then prevailing which can be filled now only at a loss. Changes in the management were made early this year, and since that time orders have been accepted only if they will assure a profit. Another difficulty was an over-expansion into the domestic appliance field. This division from Jan. 1 to June 30, 1948, incurred losses of $602,300. This business has been sold to Admiral Corp., and Pressed Steel anticipates an improved financial picture to result.

Twin Coach Makes Swiss Delivery

TWIN Coach Co., Kent, O., recently delivered five 44-passenger busses to Luzern, Switzerland, in only a little more than 60 days after receipt of the order. Twin Coach reports that its export business is increasing rapidly and that several multimillion dollar orders have been received and will be announced shortly.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Gray **Iron Founders' Society,** Cleveland, has launched an Indianapolis group of management executives representing foundries in central Indiana and eastern Illinois. Harry D. Caylor, president, C. & G. Potts Co., Indianapolis, is chairman of the new unit.

—o—

Ohio Knife Co., Cincinnati, is this year celebrating its 50th anniversary.

—o—

Stoker Manufacturers' Association, Chicago, reports factory sales of mechanical coal stokers of all sizes and types in June amounted to 8135 units, an increase of 23 per cent over sales for May and 33 per cent above sales for June, 1947.

—o—

Vulcan Rail & Construction Co., Maspeth, N. Y., fabricator of pipe railing, pipe products and miscellaneous steel specialties, has opened a midwest office at 30 N. LaSalle St., Chicago. William E. Vance is in charge.

—o—

Superior Metal Powders Corp., Toledo, O., has begun manufacture of copper powder designed for use in powder metallurgy, paint and chemical industries. This item will supplement Superior's production of iron powder.

—o—

Vacuum Cleaner Manufacturers' Association, Cleveland, reports factory sales of standard-size household vacuum cleaners in July totaled 229,537 units compared to 256,071 in the preceding month. Production was down 18.7 per cent from July, 1947. The vacation period and the shutdown of one factory because of labor negotiations account for the decline.

—o—

Eastern Cutter Corp., Newark, N. J., operating a recutting service for milling cutters and allied products, has been re-purchased by A. R. Abeel Sr., former president, who sold his controlling interest in 1945 because of ill health. Mr. Abeel has also purchased L.T.S. Cutter Co. Inc., Newark, and has merged the two firms.

—o—

Air Reduction Sales Co., New York, subsidiary of Air Reduction Co. Inc., manufacturer of welding and cutting gases, apparatus and supplies, has appointed Adelson-Wirts Inc., Hartford, Conn., as a dealer.

—o—

Crane Co., Chicago, manufacturer of valves, plumbing fixtures and other products, has contributed $150,000 to the University of Chicago's basic research program.

—o—

Globe-Union Inc., Milwaukee, has purchased three buildings and equipment from War Assets Administration for $175,000. The facilities, situated on land owned by Globe-Union adjacent to its Milwaukee plant, were operated during the war by the company for the manufacture of steatite, an insulation for radio and electronic equipment. Firm will continue commercial production of this material.

—o—

Cyril Bath Co., Cleveland, maker of machine tools and machinery, has acquired Goodyear Aircraft Corp. patents on roto forming in the United States, Canada and England. Goodyear and Bath developed concurrently, during the war years, machinery and methods for forming parts for aircraft, automotive and home appliance industries by stretching metals to their elastic limits.

—o—

Foundry Equipment Co., Cleveland, has appointed McArdle Equipment Co., Houston, as its sales representative for Coleman core and mold ovens in Louisiana and Texas.

—o—

General Electric Co., Schenectady, N. Y., is offering a course in industrial heating Sept. 13-17 at Adirondack Inn, Sacandaga Park, N. Y. Course is designed primarily for power-sales engineers of utility companies.

—o—

American Society for Quality Control, New York, formed in February, 1946, now has 31 sections with 2200 members in the United States and Canada.

—o—

Wood Pallet Co., New York, manufacturer of materials handling equipment, has opened a Boston office at 419 Boylston St.

—o—

Cutler-Hammer Inc., Milwaukee, manufacturer of motor controls and related electrical devices, has opened new and expanded quarters for its district sales office and warehouse at 1331 Dragon St., Dallas, Tex. E. K. Anderson is district manager.

—o—

Bendix Aviation Corp., Detroit, has purchased two aircraft parts plants at South Bend, Ind., from War Assets Administration for $1,050,000. Both plants were operated by Bendix during the war for production of carburetors and machine parts.

—o—

National Conference on Industrial Safety has been called by President Truman for Sept. 27-29 in Washington to determine a long-term program of co-operative action by management, labor and government for promoting industrial safety and reducing the present accident rate.

—o—

SKF Industries Inc., Philadelphia, has begun production on a new type of anti-friction tape tension pulley designed to aid in the spinning of cotton and worsted yarns.

—o—

Thermoid Co., Trenton, N. J., announces that its new plant at Nephi, Utah, is now in 75 per cent operation. Industrial belts, hose and molded products for the oil field will be manufactured in the new unit.

—o—

Laeco Inc., Cleveland, has been purpurchased by M. O. Shepherd, formerly works manager of Bunell Machine & Tool Co., Cleveland. Firm's name has been changed to Shepherd Special Machine & Die Co. Officers include Mr. Shepherd as president and Don E. Shepherd as vice president.

—o—

Harnischfeger Corp., Milwaukee, plans to begin output of a sugar cane loader, at a $750,000 plant now under construction at Escanaba, Mich.

—o—

F. J. Stokes Machine Co., Philadelphia, has enlarged and improved its shop for the manufacture of punches and dies for industrial and pharmaceutical tablet machines.

—o—

Brooks & Perkins Inc., Detroit, designer and fabricator of sheet magnesium, has taken over manufacturing space formerly occupied by Greyhound Lines adjoining its Detroit plant and plans to expand its operations by more than 100 per cent.

—o—

Department of the Army has awarded a contract to Johns Hopkins University, Baltimore, for research work on weapons, strategy, tactics and logistics.

—o—

Pontiac Motor Division, General Motors Corp., Detroit, has received its 10,000th employee suggestion since origination of the award plan in 1942. In that time 2254 suggestions have been accepted for use, with awards totaling $114,212.

—o—

Bureau of Mines has issued a report surveying the latest German coking practices and equipment.

The Business Trend

ANOTHER week of high level production went into the record, with STEEL's industrial production index climbing slightly to 171 per cent (preliminary) of the 1936-1939 average for week ended Aug. 21. Steel ingot production continued to support the high level of industrial activity by advancing fractionally to 95 per cent of capacity.

AUTOMOBILES—Although automobile production figures for the week ended Aug. 21 rose only 1500 units, they represented the highest figure for the month. In view of trying supply problems, this result indicates that the automobile builders have been able to set up temporary supply sources in order to keep going. Some of the automobile makers have continued to eat up dwindling supplies of components on hand in order to continue production, and their immediate outlook is not bright.

ELECTRIC POWER — Kilowatt-hour consumption figures for the nation this summer are much higher than for the same period last year. The weekly average for the last two months is above 5 million kilowatt-hours and figures for the last few weeks are almost as high as the peak figures last winter when more power was being consumed for home use.

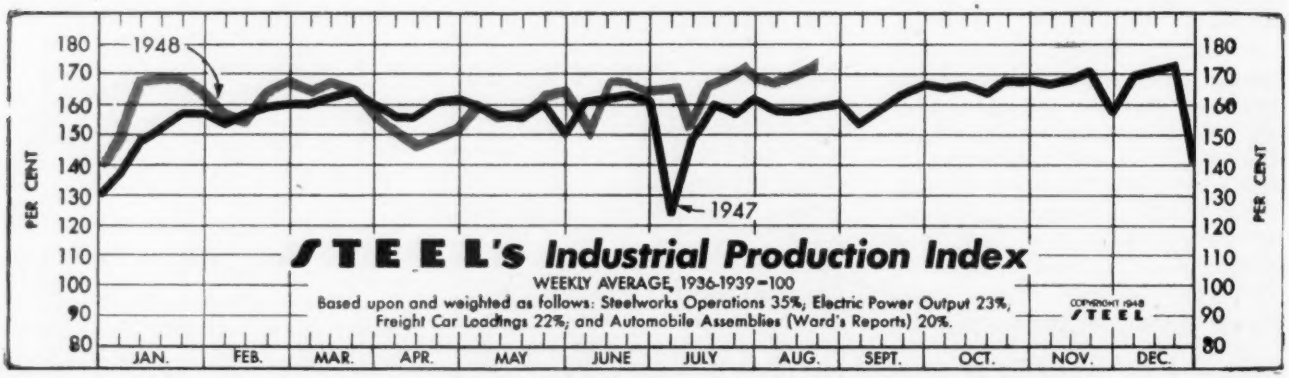
COAL—Bituminous coal production for the week ended Aug. 14 was 300,000 net tons higher than the previous week and topped the figure for the corresponding week last year by 724,000 net tons.

BUSINESS—Business failures for the month of July declined slightly to 420 from the June total of 463, as reported by Dun & Bradstreet Inc. About two-thirds of the casualties were businesses established since the war. The total for the month is higher than for any July since 1942, indicating that even with the current boom a new business venture is by no means assured of success.

MANUFACTURERS' INVENTORIES—As of June 30, inventories held by manufacturers carried an estimated book value of $29.8 billion, with those held by the durable goods group aggregating $13.8 billion. The $400 million rise for the month marks the largest monthly increase since January.

PRICES—Average primary market prices edged off to 169.0 per cent of the 1926 average for the week ended Aug. 14, from the postwar peak of 169.2 recorded the previous week. Higher transportation costs led to increased prices for bituminous coal, with copper and pig iron prices showing a further increase during the week. Galvanized sheets, gray iron castings and copper wire were also higher priced.

INCOME—Income payments, which are a measure of the current income received by individuals from all sources and consisting of wages and salaries, the net income of unincorporated businesses including farms, dividends, interest, net rents and similar items, were of a record dollar volume in 1947, according to Office of Business Economics, Commerce Department. For the continental United States, the total income received by individuals rose 11 per cent from 1946 to 1947, from $171 billion to $190 billion.



Index (chart above): Week ended Aug. 21 (preliminary) 171 Previous Week 170 Month Ago 171 Year Ago 159

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	95.0	94.5	93.0	93.0
Electric Power Distributed (million kilowatt hours)	5,391	5,317	5,342	4,953
Bituminous Coal Production (daily av.—1000 tons)	2,076	2,023	2,036	1,958
Petroleum Production (daily av.—1000 bbl.)	5,521	5,507	5,448	5,153
Construction Volume (ENR—Unit $1,000,000)	$117.1	$194.4	$143.2	$109.4
Automobile and truck output (Ward's—number units)	113,847	112,342	118,797	84,726

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

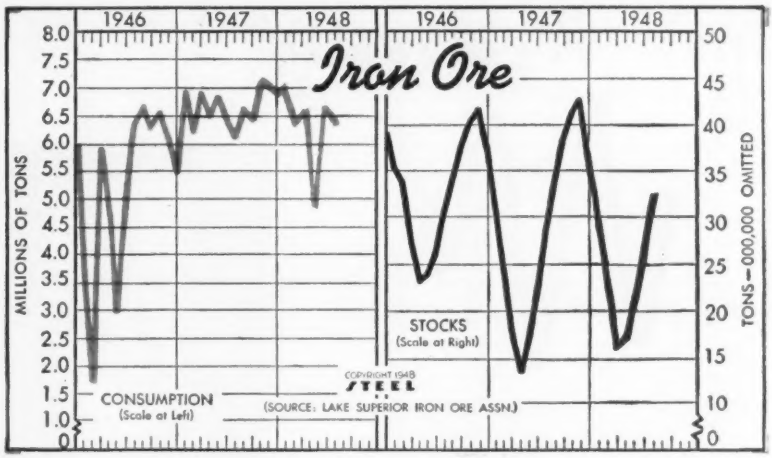
TRADE				
Freight Carloadings (unit—1000 cars)	894†	891	883	901
Business Failures (Dun & Bradstreet, number)	94	103	91	59
Money in Circulation (in millions of dollars)‡	$27,979	$27,966	$27,864	$28,239
Department Store Sales (changes from like wk. a yr. ago)‡	+15%	+17%	+9%	−6%

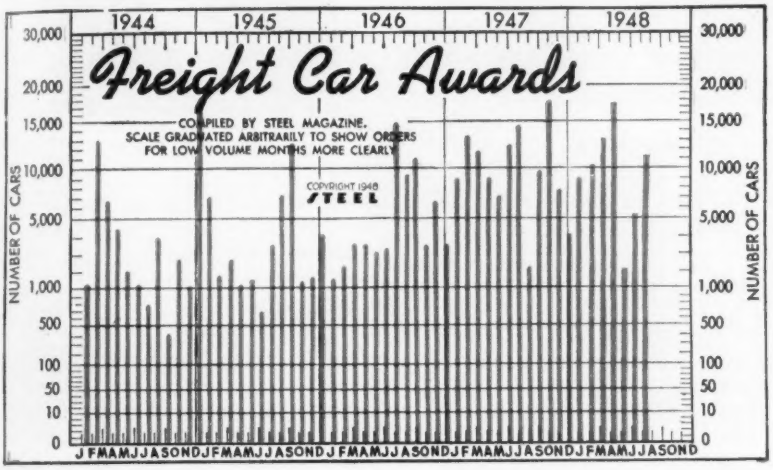
† Preliminary. ‡ Federal Reserve Board.

Iron Ore

(Lake Superior Iron Ore Assn.)
Gross tons—000 omitted

	Consumption		Stocks at Lake Erie Docks and Furnaces	
	1948	1947	1948	1947
Jan.	7,057	7,024	29,081	30,514
Feb.	6,440	6,264	22,628	24,317
Mar.	6,634	6,979	16,022	17,411
Apr.	4,976	6,579	17,125	13,555
May	6,656	6,885	22,058	17,618
June	6,577	6,500	26,965	21,746
July	6,479	6,156	32,611	28,440
Aug.	....	6,638	.....	33,896
Sept.	....	6,492	.....	38,370
Oct.	....	7,151	.....	41,641
Nov.	....	7,068	.....	43,010
Dec.	....	6,970	.....	36,095
Total	....	80,807		




1944
1945
1946
1947
1948
Freight Car Awards
COMPILED BY STEEL MAGAZINE.
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
COPYRIGHT 1948 STEEL
NUMBER OF CARS
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

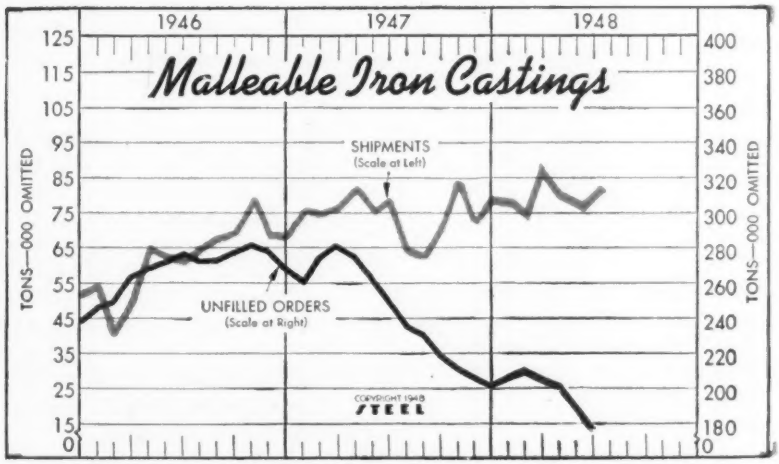
Freight Car Awards

	*1948	*1947	*1946	1945	1944
Jan.	9,213	9,172	1,481	7,200	1,020
Feb.	10,698	13,727	2,328	1,750	13,240
Mar.	13,427	12,049	3,512	2,500	6,510
Apr.	18,252	9,296	3,564	1,120	4,519
May	2,230	7,389	2,900	1,526	1,952
June	5,873	12,784	3,335	670	1,150
July	11,923	14,840	14,836	3,500	795
Aug.	....	2,372	9,527	7,240	3,900
Sept.	....	9,917	11,102	12,840	400
Oct.	....	17,737	3,407	1,320	2,425
Nov.	....	8,169	6,690	1,650	1,065
Dec.	....	4,218	3,441	4,116	16,245
Total	....	†121,707	66,723	45,432	53,221

* American Railway Car Institute.
† Preliminary.

Malleable Iron Castings

	Shipments (000 omitted)		Unfilled orders for castings for sale (000 omitted)	
	1948	1947	1948	1947
Jan.	77.7	75.9	206	260
Feb.	75.2	74.7	209	274
Mar.	86.8	76.6	203	281
Apr.	80.6	81.9	200	275
May	76.1	75.5	192	262
June	81.7	78.5	179	249
July	...	64.2	...	235
Aug.	...	62.4	...	230
Sept.	...	71.6	...	218
Oct.	...	84.0	...	211
Nov.	...	72.1	...	206
Dec.	...	77.8	...	202
Total	....	895.1	...	...



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,829	$11,924	$14,257	$12,100
Federal Gross Debt (billions)	$253.4	$253.2	$253.4	$260.0
Bond Volume, NYSE (millions)	$12.1	$13.5	$20.0	$14.9
Stocks Sales, NYSE (thousands)	3,076	3,949	6,906	3,073
Loans and Investments (billions)†	$63.0	$63.2	$62.9	$63.5
United States Gov't. Obligations Held (millions)†	$34,652	$35,023	$34,656	$38,588

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$93.55	$93.55	$89.09	$75.41
All Commodities†	169.0	169.2	168.9	152.7
Industrial Raw Materials†	182.5	184.3	186.4	166.8
Manufactured Products†	164.7	164.3	163.4	147.8

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

FRANK J. MILLER

JAMES BOYD

LOWELL D. RYAN

Frank J. Miller has been appointed general sales manager, New Departure Division of General Motors Corp., at Bristol, Conn. He succeeds **Lester G. Sigourney,** who is retiring this month after 40 years' association with this division. Mr. Miller has been in charge of the New Departure Chicago office for 11 years. **William T. Murden** of Bristol, assistant general sales manager for the last 5 years, has been transferred to Meriden, Conn., as resident manager of the division's plant in that city.

—o—

Robert J. Stein, assistant secretary and assistant treasurer, Acme Aluminum Alloys Inc., Dayton, O., has been appointed sales representative for Michigan. He will have headquarters at Detroit.

—o—

Sterling Mfg. Co., Cleveland, announces appointment of **John Frazier** as New York sales representative covering the entire state with the exception of metropolitan New York. He is associated with John Frazier Co., Rochester, N. Y., and will represent Sterling Mfg. Co. in the sale of its complete line of ammeters, voltmeters, milliameters, hearing aid testers and special and standard type instruments.

—o—

Dr. Richard C. Hitchcock has been appointed science lecturer for research laboratories of Westinghouse Electric Corp., Pittsburgh.

—o—

Elliott Co., Jeannette, Pa., announces appointment of **C. F. McGinnis** as assistant sales manager of its Ridgway Division. Associated with the company since 1936, he has been in the electric power department at Ridgway, and also was manager of the Kansas City, Mo., office before he returned to Ridgway Division last year.

—o—

James Boyd, formerly eastern district manager, Westinghouse Electric Corp., Pittsburgh, has been appointed general sales manager of the Hamilton Division of Lima-Hamilton Corp., at Hamilton, O., which manufactures diesel and steam engines, machine tools, presses for automotive industry, can making and special machinery, and other industrial equipment. He had been associated with Westinghouse since 1917.

—o—

Louis E. Almgren, manager of works engineering and tool manufacturing, Talon Inc., Meadville, Pa., has resigned, effective Sept. 15, to become works manager of Webster-Chicago Corp., Chicago. He will be succeeded at Talon Inc. by **Fred K. Keefer** as chief works engineer, and **Gleason W. Starn** as superintendent of tool manufacturing, both reporting to **Grosvenor S. McKee,** vice president and works manager.

—o—

Morgan B. Lawton has been appointed manager, Lincoln Lubricating Systems Inc., Cleveland, sales agency of Lincoln Engineering Co., St. Louis, with which company he also continues as manager of its sales branch in Detroit. **Ralph Morens,** assistant manager at Detroit since February, continues in that capacity. **Warren Kline,** associated with Lincoln Engineering Co. for 12 years, has been named assistant manager of Lincoln Lubricating Systems Inc.

—o—

Francis B. Harper has been appointed superintendent of bar mills at the Lackawanna, N. Y., plant of Bethlehem Steel Co., where he was transferred Aug. 1 from the company's Johnstown, Pa., works. He will direct operations of the 8, 10 and 12-inch mills.

—o—

Lowell D. Ryan has been appointed managing director of the Malleable Founders' Society, Cleveland. Mr. Ryan attended the University of Illinois and Lincoln College of Law and engaged in the practice of law and newspaper work in Springfield, Ill., until 1942, when he joined the Federal Bureau of Investigation. He had been manager of the legislature department of the Illinois State Chamber of Commerce since October, 1944.

—o—

Dr. Carey B. Jackson, research chemist, Mine Safety Appliances Co., Pittsburgh, has been awarded the U. S. Navy's Public Service Award for his contribution to the development of navy oxygen breathing apparatus and the engineering development of the commercial production of potassium, potassium-sodium alloys and their oxides in World War II.

—o—

Leland W. Mosher has been elected an assistant secretary of General Electric Co., Schenectady, N. Y. He will also retain his present position as manager of the company's Insurance Division.

—o—

John P. Starnes, sales representative, Southern States Iron Roofing Co., Birmingham, has been appointed manager of the company's Orlando, Fla., branch warehouse.

—o—

Worthington Pump & Machinery Corp., Harrison, N. J., has announced appointment of **Frederick J. Ellis** as

Stock 52100 tubes shipped to you . . . in 24 hours!

FAST delivery of your orders for warehouse quantities of 52100 seamless steel tubes is assured by The Timken Roller Bearing Company's large mill stock.

One hundred and one sizes of 52100 tubes, ranging from 1" to 10½" O.D., are available for shipment *within 24 hours* after receipt of your order!

In each shipment of 52100 tubes, you're sure of getting the same high tensile strength, extreme hardenability, high fatigue strength and excellent machinability. The world's largest producer of 52100 tubing, the Timken Company closely controls every step in the production of 52100 tubes—from melt shop through final inspection.

So for fast delivery and uniform quality, write, wire or telephone us your order for 52100 seamless steel tubes. And for up to date information on sizes, tolerances, finishes and prices of available 52100 tubes, ask to be added to our regular 52100 mill stock mailing list. Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio.

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

TIMKEN

TRADE-MARK REG U. S. PAT. OFF.

Fine Alloy

STEEL

and Seamless Tubes

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

assistant merchandising manager, pumps and compressor sales. Formerly assistant manager of Reciprocating Pumps Sales Division, Mr. Ellis will head up distribution of standard pumps and compressors through oil field distributors. He has been connected with the corporation since 1916.

—o—

Lloyd E. Slater has been appointed industry engineer in charge of food industry applications for measuring and controlling devices, made by Brown Instrument Co. and Minneapolis-Honeywell Regulator Co., Minneapolis.

—o—

F. N. Wardell has been appointed Pacific Northwest representative of Essex Wire Corp., with headquarters in Portland, Oreg.

—o—

John H. Bailor has been named resident sales engineer in Reno, Nev., for General Electric Co. He formerly was in the company's Sales and Engineering Divisions in San Francisco.

—o—

C. M. Kemp Mfg. Co., Baltimore, announces retirement of **E. B. Parsons** as its San Francisco area representative. Mr. Parsons has been the Kemp representative for 30 years. He is succeeded at San Francisco by E. A. Wilcox Co., engineer, at 277 Seventh St., San Francisco, with a branch office in Seattle.

—o—

Harry M. Jacobs, commercial engineer in the Transportation Division, General Electric Co., Schenectady, N. Y., has retired after 42 years' continuous service with the company.

—o—

Allied Research Products Inc., Baltimore, announces that the following agents have been appointed for the sale of Iridite, the corrosion resistant treatment for zinc and cadmium surfaces. **L. J. Camill,** Detroit, to cover all of Michigan; **J. A. Cairns,** Yeadon, Pa., to cover eastern Pennsylvania and New Jersey; **Industrial Chemical & Equipment Co.,** Minneapolis, to cover western Wisconsin and Minnesota; **LaSalco Inc.,** St. Louis, to cover the southeast states; **Mitchell-Bradford Co.,** Bridgeport, Conn., continues coverage of New York and New England; **A. L. Poe,** Chicago, continues as district sales manager for Chicago and the central states. **Ray Stricklen** has joined the company's Baltimore plant as assistant development engineer.

—o—

John T. Kiley, manager, O. Hodgkins & Co., Boston, has been named manager of the Boston Division of James Flett Organization Inc., Chicago, Ill., with offices in Boston.

—o—

John F. Wilson will act as senior resident representative of American Machine & Foundry Co. in Buffalo in the absence of **Samuel S. Auchincloss,** vice president in charge of operations of the company's Pinspotter Division in Buffalo. Mr. Auchincloss is in Sweden on a year's leave, serving as head of the industry section, Economic Co-operation Administration's mission to Sweden. Mr. Wilson was formerly assistant to Mr. Auchincloss.

—o—

Frank A. Rough, metallurgical engineer, has been named to the staff of Battelle Memorial Institute, Columbus, O., where he will be associated with its research in the field of industrial physics. He is a member of the American Society for Metals, the American Institute of Mining & Metallurgical Engineers, and several engineering honor societies.

—o—

W. E. Vance has been placed in charge of the Mid West office recently opened in Chicago by Vulcan Rail & Construction Co., New York.

—o—

Robert P. Bremner has been appointed mining engineer by Youngstown Sheet & Tube Co., Youngstown. He will deal with all mining problems of the company. Mr. Bremner joined Youngstown Sheet & Tube Co. several months ago, having previously spent 11 years with Pickands, Mather & Co. in the Lake Superior iron ore region.

—o—

Avondale Marine Ways Inc., Westwego, La., announces appointment of **Capt. Harry L. Dodson,** USN (retired) to managership of its quick repair yard on the Intracoastal Waterway at Harvey, La. An engineer in the Navy for the past 30 years, Capt. Dodson served as industrial manager of the 8th Naval District from 1943 to 1946. His last tour of duty on the active list of the Navy was as director of the Material Laboratory, New York Naval Shipyard.

—o—

Robert A. Anderson has been appointed Chicago sales representative, Ingram-Richardson Mfg. Co., Beaver Falls, Pa., and Ing-Rich Metal Products Co., East Palestine, O. Associated with Ingersoll Steel Division of Borg-Warner Corp. since 1930, Mr. Anderson has served in both manufacturing procurement and sales capacities, and during the war headed the Procurement Division for the Borg-Warner amphibian tank program. Most recently he has been manager of contract sales for Ingersoll Chicago and Kalamazoo, Mich., plants.

—o—

Howes-Woods Co., Cambridge, Mass., announces appointment of **David A. Utiger** as sales manager of the Saw Division, effective Aug. 1. For the past eight years, Mr. Utiger has been manager of the Industrial Division, Capewell Mfg. Co., Hartford, Conn., and has been active in the hack saw industry for many years.

—o—

J. P. Bankson has been named assistant to the vice-president, Harbison-Walker Refractories Co., Pittsburgh. Mr. Bankson joined the Cleveland office of Harbison-Walker as a salesman in 1930 after an eight-year association with General Refractories Co., and in 1935 was transferred to the Pittsburgh headquarters of the company as a district sales manager, serving in that capacity until his recent appointment.

—o—

Ralph J. Kraut, president and general manager, and **K. F. Gallimore,**

CAPT. H. L. DODSON

J. P. BANKSON

These Threads are too shallow

These Threads are too deep

These Threads are just right

Circle Ⓑ Bolts and Nuts . . . both standard and special . . . are noted for their uniform size and strength. They keep production lines moving with top efficiency.

BUFFALO BOLT COMPANY
North Tonawanda, N. Y.
SALES OFFICES IN PRINCIPAL CITIES
Export Sales Office: Buffalo International Corp., 50 Church Street, New York City

. . . they are CIRCLE Ⓑ BOLTS

vice-president in charge of engineering, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., have left on a seven-week trip to England and the continent of Europe. In England they will attend the Olympia Fair where Giddings & Lewis has several large machines on exhibit and will visit European customers after the fair.

—o—

D. J. Dowsett, general manager, Standard Stamping Co. Inc., Nashville, Mich., was recently elected to the board of directors and appointed resident agent of the firm. Mr. Dowsett formerly was production supervisor at Detroit Transmission Division, General Motors Corp., Detroit, Packard Motor Co., Detroit, and E. W. Bliss Co., Hastings, Mich.

—o—

John F. White recently transferred to the Boston office of Dow Chemical Co., Midland, Mich., from the firm's New York branch. He will sell general magnesium products throughout Massachusetts, Vermont, New Hampshire and a part of Connecticut.

—o—

Robert M. Vilsack has joined the Sales Department of Taylor Forge & Pipe Works, Chicago, reporting to the main plant. Mr. Vilsack was recently associated with M. W. Kellogg Co., New York, in engineering and sales work.

—o—

De Laval Steam Turbine Co., Trenton, N. J., announces appointment of **J. A. Greenland** as district manager of the De Laval Seattle office. Mr. Greenland has been with the company since 1938 and in the Seattle office since 1940.

—o—

D. A. McCoy has been appointed assistant superintendent of the mechanical department at Republic Steel Corp.'s Youngstown plant. He was formerly assistant general mechanical foreman of the electric weld tube mills. **T. S. McLaughlin,** former yardmaster, was appointed assistant superintendent of the Transportation & Labor Department.

—o—

Barry G. Wagner has joined the industrial sales department of Bethlehem Steel Co., Bethlehem, Pa., in the San Francisco yard of the Shipbuilding Division.

—o—

Robert B. Latta has been named general manager of Youngstown Mazda Lamp Works of General Electric Co., Schenectady, N. Y. He succeeds **Donald P. Wright** who has been with the Youngstown plant since 1913 and general manager since 1936. Mr. Wright continues as consultant and will retire Nov. 1. Mr. Latta joined General Electric in 1921 and had been assistant general manager for the last 12 years.

THEODORE A. SIEDLE

—o—

Dravo Corp., Pittsburgh, announces appointment of **Theodore A. Siedle** to the Industrial Relations Staff to head up and co-ordinate management development and training throughout the corporation and its subsidiaries. Formerly on the training staff of Aluminum Co. of America, Mr. Siedle prior to the war was Dean of Instruction, State Teachers College, California, Pa. During the war he was engaged in organization, operation and general administration of various Army educational programs in the European Theater, attaining the rank of colonel.

—o—

Directors of Youngstown Steel Door Co., Cleveland, have elected **John P. McWilliams,** president of the company since 1933, as chairman of the board. Mr. McWilliams has been with the company since 1924 after an association with Union Carbide & Carbon Corp. **Harold H. Henricks,** former vice-president in charge of manufacturing, was elected president of Youngstown Steel Door.

—o—

Woodrow P. Pribbanow has been appointed manager of Milwaukee sales and service branch, Pitney-Bowes Inc., Stamford, Conn. He succeeds **John C. Cheney,** who will manage the Pittsburgh branch of the company.

—o—

James P. Tyrrell has been appointed representative for the District of Columbia, Virginia, Maryland and Delaware with headquarters in Washington by Lustron Corp., Columbus, O.

—o—

Richard J. Sheridan has retired as president of John B. Astell Co., New York, and his interests in the company have been acquired by **John B. Astell,** who becomes president of the Astell Co., which will continue to operate as a warehouse distributor of stainless steel pipe, tubing and accessory valves and fittings, carbon steel welding fittings and flanges, pressure vessel fittings, boiler and condenser tubes.

—o—

Eutectic Welding Alloys Corp., New York, announces appointment of **Robert H. Groman** and **L. D. Richardson** to the board of regional sales supervisors. Both men were formerly welding specialists for the company and were later promoted as assistants to the general sales manager. Mr. Groman now assumes full responsibility as regional sales supervisor in the West Central area of the United States and Mr. Richardson will hold a similar position in the South Central area.

—o—

L. F. Carlson has been appointed general merchandising manager for the Oldsmobile Division of General Motors Corp., at Lansing, Mich., and **W. O. Lampe** has been named assistant general merchandising manager of the division. **L. L. Johnson,** formerly manager of the organization and analysis department, has been named administrative assistant to the general sales manager, the position previously held by Mr. Lampe. **H. G. Ellis,** formerly assistant to Mr. Johnson, has been promoted to manager, organization and analysis department.

—o—

Walter J. Bloom, for several years Detroit assistant district sales manager, Weirton Steel Co., becomes vice president of General Sheet Steel Co., steel warehousing and service company, effective Sept. 1. Prior to his association with Weirton, he was active in metallurgical and sales work for Otis Steel Co. and Jones & Laughlin Steel Corp.

—o—

Harry C. Taylor has joined the operating staff of Globe Iron Co., Jackson, O., as blast furnace superintendent. **Benjamin I. Eggers** is the general superintendent.

—o—

Richard T. Ubben has been appointed technical director and **Elmer H. Koll** has been appointed assistant technical director of Milwaukee Paint Division, Pittsburgh Plate Glass Co., Pittsburgh. Mr. Ubben succeeds **Dr. W. W. Bauer,** technical director of the firm's paint operations, in the Milwaukee position, after 19 years of association with the paint industry of which the last six were with

F. C. FRARY

Elected to receive Gold Medal of American Society for Metals. Noted in STEEL, August 23 issue, p. 68

C. H. WITTENBERG

Elected executive vice president, Gladding McBean & Co., Los Angeles. Noted in STEEL, August 16 issue, p. 84

LOUIS W. MASON

Appointed assistant to general manager of sales, National Tube Co., Pittsburgh. Noted in STEEL, August 16 issue, p. 82

Pittsburgh Plate. Mr. Koll has been with the company since 1928 and in his new position will continue to supervise the industrial development and service work which he has handled during the past seven years.

—o—

L. E. Loveland has been named Great Lakes district manager for Hotpoint Inc., Chicago and will make his headquarters in Cleveland. Mr. Loveland was associated with Eureka Williams Corp. for a number of years as Great Lakes regional manager, and more recently as assistant manager. He succeeds Walter BonDurant who entered private business.

—o—

David K. Miller was recently appointed Connecticut representative for Pratt & Inman Steel Warehouse, Worcester, Mass. Mr. Miller had been sales representative for Crucible Steel Co. of America for 21 years.

—o—

Butterfield Division, Union Twist Drill Co., Derby Line, Vt., has appointed **W. V. Garfield** as district sales engineer for Connecticut and western Massachusetts. Mr. Garfield had been previously associated with Darra-James Mill Supply Co., and Scovill Mfg. Co. He will handle Butterfield's line of taps, dies, reamers and other industrial cutting tools.

—o—

Reed W. Hyde is joining the Sintering Machinery Corp., Netcong, N. J., as president on Sept. 1. Mr. Hyde has more than thirty years' experience in designing, building and operating sintering plants for ferrous and nonferrous ores and metallic materials. He was most recently associated with Irvington Smelting & Refining Works.

—o—

Jacob J. Joachimi, formerly superintendent of the manufacturing and tooling department, Bell Aircraft Corp., has been appointed plant manager of Buffalo Tool & Die Mfg. Co., Buffalo.

—o—

Alexander Zekany has been named sales metallurgist by American Cladmetals Co., Carnegie, Pa. Mr. Zekany will have direct charge of the development of applications of Rosslyn Metal with the company's customers.

—o—

Phillips B. White has been appointed manager Bond plant, American Radiator & Standard Sanitary Corp., Buffalo. Mr. White was formerly superintendent of the plant.

OBITUARIES . . .

William L. Mayberry, 60, partner with Charles Brady in the Industrial Castings Co., Wyandotte, Mich., was killed in an automobile accident Aug. 21.

—o—

Raymond Van Auken, 47, for 20 years sales representative of Budd Co., Detroit, and for the past year West Coast sales representative of that firm, died in Los Angeles, Aug. 21.

—o—

Raymond G. Haskins, 59, president, R. G. Haskins Co., Chicago, died Aug. 17 in Oak Park, Ill. He founded the company in 1916.

—o—

John Ahnfelt, 76, operating manager of Universal Atlas Cement Co. plants, Chicago, until his retirement in 1937, died Aug. 18. He was a leading figure in the development of cement made from blast furnace slag and was named operating manager for all of the company's cement plants in 1918, serving in that position until his retirement.

—o—

Albert H. Inman, 80, retired steel manufacturer died Aug. 22 at his summer home in Princeton, N. J. He was the third generation of the century old firm of Pratt & Inman, Worcester, Mass.

—o—

Henry L. Wehrheim, 41, president of the Wehrheim Machinery Co., Newark, N. J., died Aug. 20. He founded the company in 1932.

—o—

W. J. Dorworth, 67, manager of the Atlantic District, Apparatus Department, General Electric Co., Schenectady, N. Y., until his retirement last January, died Aug. 12, in Bellefonte, Pa. He joined General Electric after his graduation from Pennsylvania State College in 1904 and remained with the company throughout his entire business career.

—o—

Edgar L. Rossin, 47, vice president of Miami Copper Co. and a board member of Tennessee Copper Co. died last week of a heart attack while on a fishing trip near Sante Fe, N. M.

—o—

Ward D. Kerlin, 70, secretary and treasurer of Camden Forge Co. until his retirement in 1945, died Aug. 23 in Moorestown, N. J. In addition to his business interests, he was a founder of the Woodrow Wilson Foundation.

—o—

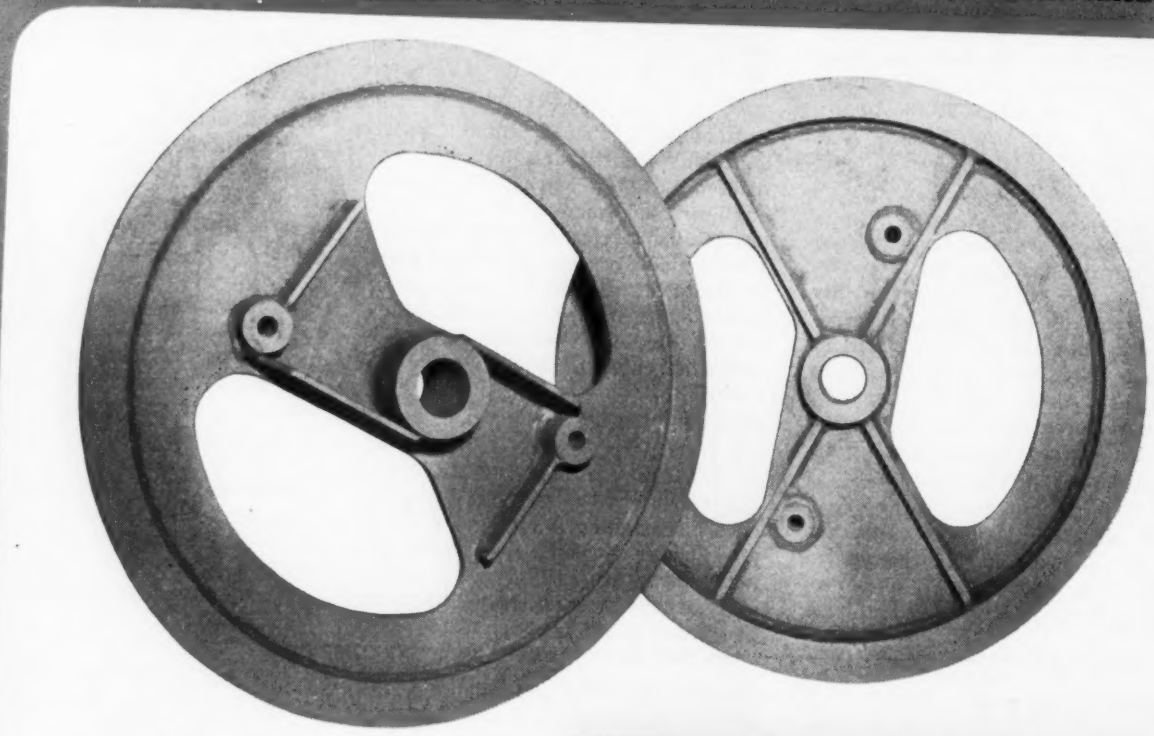
Frank Bantivoglio, 48, executive of several New Jersey steel firms died Aug. 19 in Camden, N. J. He was vice president of Camden Compressed Steel Co., Camden Iron & Metal Co., and N. Bantivoglio & Sons Inc.

Rugged Construction Machinery Uses DESIGNED CIRCULAR WELDMENTS by AMERICAN WELDING

● This specially designed weldment combines an arc welded center section of flame cut gussets and web (AISI-C-1020), hub and bosses (AISI-C-1030) and a flash-butt weld outer gear ring (AISI-C-1045) which is 24" O.D. x 21" I.D. x 2".

Manufacturers who have unusual welding jobs often call in American Welding for design and manufacturing suggestions. They know they receive the full benefit of 31 years of experience. They know also that their jobs are of the highest quality when manufactured by American Welding's Controlled Technique.

May we apply this experience to your product? An American Welding representative will be glad to call at your convenience.



SEND FOR ILLUSTRATED BOOKLET

THE AMERICAN WELDING AND MANUFACTURING COMPANY

110 DIETZ ROAD ● WARREN, OHIO

Engineering News . . . AT A GLANCE

"BUCKETS" OF BOLTS—It takes a vast quantity of fasteners to hold a railroad together. In case of the Pennsylvania Railroad, according to American Institute of Bolt, Nut and Rivet Manufacturers, consumption of fasteners for last year amounted to 37,575 tons. Of this total, 14,800 tons were bolts and nuts, 10,500 tons were spikes and 9000 tons were rivets. Balance included machine and wood screws plus rail anchors. A typical freight train, consisting of 100 hopper cars with a capacity to 7000 tons of ore, utilizes 60 tons of rivets and 1 ton of bolts, exclusive of those on the locomotive and tender.

NEW HEAT SOURCE— Infra-red heating now may be obtained through the use of metallized tempered glass plates currently being produced by Oscar Fisher Co. Inc., New York. The company reports the plates may be used for all applications requiring even, controlled heat. Advantages include increased efficiency in regard to current consumption, broader heat coverage of area and reduced breakage loss.

PACKAGE ENGINEERING— Because packaging is treated strictly as an engineering problem at Sylvania Electric's Radio Tube Division, customers are seldom faced with damaged goods—whether their order is for a 7-ton machine or a few hundred thousand small parts. A group of packaging specialists at the Emporium, Pa., plant begin with a sample of the product to be shipped, making their business to see that the package fits. Specificiations are as carefully drawn as for engineering "specs" for company products. Typical set of specifications, for example, includes ten to 12 sheets providing dimensioned drawings of the container, isometrics of the packaging assembly and other details.

USES STAINLESS ADJUSTMENT DIALS— Titanium-bearing age-hardening 18-8 type stainless, developed by Carnegie-Illinois Steel Corp., is used in making the newly designed adjustment dial now being incorporated on the regular line of Kearney & Trecker milling machines. Use of the metal enables the company to fabricate dials with guaranteed uniformity—a factor that assures accuracy over long service life. In turning out the dial parts, they are first machined to size and serrations are cut in the stainless steel while in softened condition. Parts are then age-hardened at 950-1100° F, producing the desired hardness without affecting the close dimensional tolerances. Vapor blasting operation is used to impart a soft finish that cuts down reflection.

COACH EVERY 38 MINUTES— Buses are rolling off the line at the rate of one every 38 minutes at the General Motors Truck & Coach Division, Pontiac, Mich. Chief factor in this unusual rate of production is an almost "revolutionary" conveying system that moves the coaches sideways while getting first their paint and later their fittings. By moving buses in this manner instead of end-to-end, it is possible to have 53 vehicles in process at one time—33 in the paint department and 20 more in the fitting area. Furthermore, employees who sand down bodies and apply masking tape preparatory to finishing work from power-operated scaffolds that raise and lower the men to proper height. Paint spray men also work from electrically-driven platforms that run the length of a vehicle, and which can be raised or lowered to correct height at the touch of a button. These platforms carry their own curtain of running water to wash away excess paint and fumes.

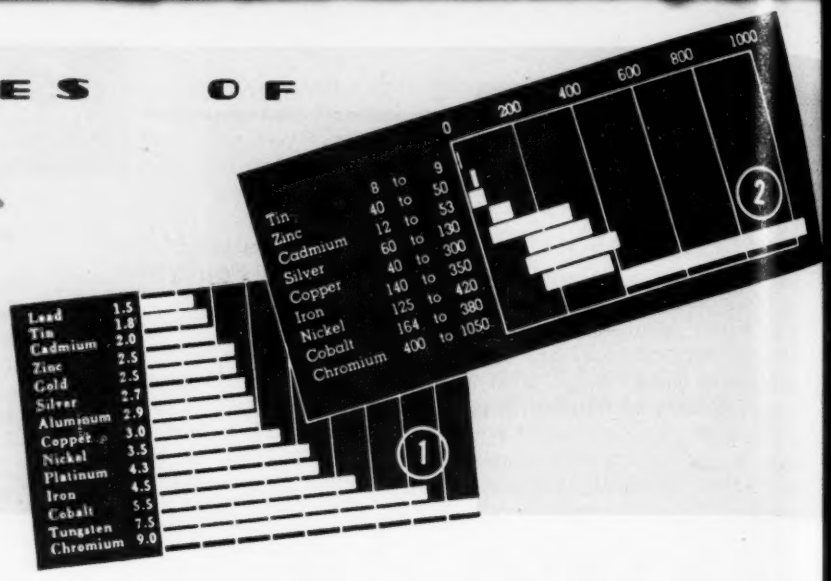
GREAT PROTECTOR — In its use functionally, chromium plating is a valuable asset to the user in its role as a protective agent. It can be employed to eliminate corrosion, either for the protection of the surface itself, or for protection of the media being handled by presenting a non-corrosive surface. When chromium is applied to roll journals which operate with both water-lubricated non-metallic and frictionless bearings, it is instrumental in affecting power savings by cutting down drag. It also prevents corrosion of areas beyond the working face of sliding parts, preventing formation of shoulders or rusted areas. Equal advantages of the plating may be derived by its use on small tools on soft metals that tend to drag or cold flow. (p. 56)

"TYPING" STEEL BLOCKS—When including impression cavities in die blocks used for forging, progress of the impression is checked from time to time by calipers, gages and similar devices. One unusual measuring unit —referred to as the "type" and used for cavities not easily measured by regular measuring instruments—consists of a hardened steel block machined and ground to exact shape of the cavity. When the portion of the die to be measured appears to be just right during the machining process, the type is covered with prussian blue, or similar material, and inserted in the cavity. It is struck sharply with one or more hammer blows and then removed. If there are "high spots"—places where not quite enough metal was removed—these will show blue while the rest of the cavity does not. (p. 59)

OPERATION "BRAKE DRUM"—Effective use of mechanized means of handling is responsible for the increased output of automotive brake drums and clutch housings in the plant of Wheland Co., Chattanooga, Tenn. In its gray iron foundry only 1¼ hours or less is required for iron flowing from the cupola spout to be transformed into a cleaned and inspected casting. The casting conveyor, leading from the shakeout, for example, instead of being located at working level where it would interfere with floor operations rises sharply and leaves the main foundry building near the ceiling in its passage to the cleaning department. (p. 81)

ADVANTAGES OF *Chromium Plating*

. . . A Review of Its Characteristics



Process also reduces adhesion and wear, thereby more than justifying its cost in many applications. Perfect adhesion of the electrodeposited metal depends on preparation of surface prior to plating

INDUSTRIAL chromium plating to provide extreme hardness and corrosion resistance is well established in the forming, rolling and forging operations of metalworking industries. Essentially, it is used for a functional purpose other than ornamentation. That purpose may be the elimination of corrosion, either for protection of the surface itself by rendering it noncorrodible, or for protection of the media being handled by presenting a surface which is noncorrosive.

Second purpose may be the reduction of adhesion. This, in turn, may bear a direct influence upon the rates of production, power requirements and quality of product. Many commercial products which are formed, pressed or thermally set are processed in contact with chromium plated surfaces in order that easy release and superior surface texture of the product may be enhanced.

Third purpose may be the reduction of wear. This applies both to forces of wear which bear upon a plated surface and also to any secondary surface which it sweeps. Chromium itself, due to its inherent hardness and close grained structure, is very slow to wear abrasively, but even more significant is the fact that it does not tend to abrade or chafe other contact surfaces.

Chromium is exceeded in hardness by boron, corundum and other comparatively rare metals. Fig. 1, Moh's scale of hardness based on a diamond hardness of 10, shows chromium rated at 9. Other metals which have been subjected to special hardening processes may be chromium plated in order to obtain an even greater surface hardness. It is sometimes possible to avoid added expense of special hardening by the practical application of chromium plate alone, utilizing cheaper base metals that need only to be hard enough to support the indenting pressure exerted upon the chromium surface. Fig. 2 shows brinell tests of various electro-deposited metals.

Low Coefficient of Friction—Due to the extremely low coefficient of friction of a chromium plated surface, neither solids nor liquids adhere to it. This high degree of smoothness makes chromium plating especially suitable in certain applications where parts are in frictional contact and which consequently benefit from prolonged life. Shown in Fig. 3, is a comparison of the static friction of chromium plated surfaces with several other types.

Special finishes may be applied to industrial chromium plate which provide advantageous nongalling properties. This type of plating is also recommended where close tolerances and smoothly operating parts are necessary.

Chromium plate has been used successfully in a variety of drying operations even when subject to alternating extremities of heat and cold without adverse effect. Care must be taken, however, to guard against too wide deviation of heat expansion coefficients in the underlying base metal. Chromium melts at 3500° F, resists oxidation to 1150° F and physical breakdown to 2500° F. Its melting point in relation to other metals is shown in Fig. 4.

Variety of Finishes—Another property of industrial chromium plate which contributes to its functional value, centers about the variety of surface finishes which may be attained through pretreatment of the base metal, through electroplating technique and through post-treatment of the plated surface. Smooth but minutely indented surfaces can be secured for use with lubricants. Close tolerances may require precision grinding or other treatment before or after plating. Also, it is often possible to convert worn rough and pitted surfaces to those of extreme smoothness by combination of electroplating technique and grinding operations.

An open-grain finish is provided for uniformity, superior lubricating characteristics and easy release of substances from its surface. It is particularly advantageous for press rolls, roll journals, engine cylinders and other applications related to minimum adhesion or to lubrication.

Adaptability of Chromium Plating—Another characteristic which cannot be overlooked is its adapt-

Fig. 1—Moh's scale of hardness of metals, based on a diamond hardness of 10

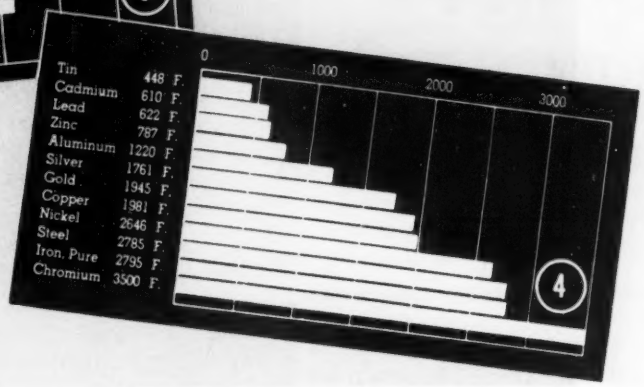


Fig. 2—Variations of brinell hardness of electroplated metals

Fig. 3—Comparative static friction values of various metals

Fig. 4 — Melting point of chromium in relation to other metals

ability since practically all base metals are suitable for chromium plating. Proper preparation of the base metal is a most important adjunct to plating and may vary according to the result desired.

Preparation of the base metal prior to chromium plating has a distinct influence upon the perfect adhesion of the electrodeposited metal. When properly plated, the plating will not chip, crack or peel, unless it is subjected to unusually severe corrosion or stress.

Commercial Plating Solution—Only type of solution that has thus far been commercially used for chromium plating is the chromic acid plus catalyst acid radical bath. It is necessary that there be present in the bath, in addition to chromic acid, one or more acid radicals which act as catalysts to bring about or aid in the cathodic deposition of chromium. The most commonly used catalyst acid radical is sulphate. Fluorides in the form of a complex, such as silicofluorides, are also used to some extent. Ratio (by weight) of chromic acid to total catalyst acid radicals must be maintained within definite limits, and preferably at about 100:1.*

While the current efficiency in chromium plating baths is low, generally in the range of 10 to 15 per cent, a fairly high rate of deposition is obtained due to the relatively high current densities used. Voltages required to obtain these relatively high current densities are generally in the range of 6 to 10 volts.

Relatively poor throwing power of chromium plating baths may be considered a disadvantage. On the other hand, remarkably good results are achieved, even in the plating of articles of irregular shape if the optimum ratio of chromic acid to total catalyst acid radical is carefully maintained.

Industrial Applications — Under normal operating conditions, industrial chromium plating may increase the life of equipment many times. Notable applications in metalworking industries include rams, plungers, cylinders and roll bearing surfaces used with draw benches, hydraulic presses, steam forge hammers and a wide variety of actuating mechanisms.

Several steel mills depend upon chromium plated plungers for maintained production with actuators of shears, clampers, piercers, balancers, draw benches, intensifiers and pull backs. Plungers operate in either horizontal or vertical positions without impairing the wear-resistant qualities of the chromium.

Rolling mills for foil, sheet and structural products find chromium beneficially applied to roll journals which operate with both water-lubricated, non-metallic bearings and with frictionless bearings. A low coefficient of friction is conducive to substantial power savings in those rolling operations that involve heavy loads and drag.

Chromium plating also prevents corrosion of areas beyond the working face of sliding parts, thus preventing the formation of shoulders or rusted areas which may interfere with adjustments in length of stroke when such are necessary. It also prevents damage to packing, especially at high pressures, which results from the operation of slightly corroded parts.

Protection for Gages and Dies—Hard, corrosion-resisting chromium plate is good protection for gages, forming dies and specialty small tools. It can be used to great advantage with drills, saws, burnishers, taps, etc., when these are employed upon composition materials, materials within corrosive media, and upon soft metals that tend to drag or cold flow.

According to the recommendations of the Chromium Corporation of America, as an established practice, mill-finished stainless steel sheets, which are free of blemishes and inclusions, are mirror-finished, then chromium plated to accentuate the mirror color and retain its fixed luster. Through cycles of pressing, the chromium prevents scuffmarks and the formation of dulled areas which normally would occur to the softer steel.

It has been found that the life of molds is materially prolonged by the wear resisting qualities of chromium plate, especially where they are subjected to extreme abrasion and severe service. The low coefficient of friction of chromium plated surfaces is particularly desirable where quick and easy release of the finished product is most essential, and in applications where it is desired to eliminate mold lubrication.

Plates and rolls used for embossing and printing are chromium plated to preserve the design, provide sharper and cleaner impressions and longer life.

Precision finished parts which are rejected for size defects can frequently be reclaimed by industrial chromium plating.

Illustrations through the courtesy of Mr. C. H. Belvin, Chromium Corp. of America, New York.

* Dubpernell, G., Modern Electroplating, p. 119, The Electrochemical Society, New York (1942).

Seen and Heard in the

Machinery Field

By GUY HUBBARD
Machine Tool Editor

BURSTING AT THE SEAMS: There has been a big change in thinking in the past 25 years in regard to arrangement of equipment in production metalworking plants here in the United States.

Back in the early 1920s, when "departmental arrangement" of machine tools was accepted practice, Ralph E. Flanders tossed a bombshell into production engineering discussions of the American Society of Mechanical Engineers by advocating what he called "unscientific scientific management".

His proposal was that instead of regimenting machine tools by types, they should be arranged functionally. In other words, he proposed that the traditional lathe departments and milling departments and grinder departments and so on, be broken up in favor of mixing up the machines in the order of sequence of operations on the work. If the work was turned, milled and drilled—then put a lathe, a milling machine and a drill press together so that the work could be passed from one machine to the other. To the horror of those who were slaves of tradition, he put that heresy into effect and the Jones & Lamson Machine Co.—and it worked out quite satisfactorily.

It is interesting to observe how those so-called "machine shop heresies" of yesteryear have come to be accepted dogmas of today—and how at the same time Ralph E. Flanders has come to be a United States Senator from Vermont. In both cases, good old-fashioned common sense has come into its own.

At a recent meeting of the Production Engineering division of ASME, A. F. Murray, works manager, Electrolux Corp., Old Greenwich, Conn., had this to say in favor of functional arrangement of machines: "In my estimation, the way to make a plant pay maximum returns on the investment it represents, is literally to have it 'bursting at the seams' as far as true productivity is concerned.

"Today, floor space represents such a heavy investment and carries such heavy overhead that idle or wasted areas due to back-tracking or 'backing up' of work in process should not be tolerated."

FOND DU LAC AND CINCINNATI: Of the various combinations and mergers which recently have taken place in the machine tool industry, one of the most interesting is the purchase by Giddings & Lewis Machine Tool Co. of Fond du Lac, Wis. of Cincinnati Planer Co. of Cincinnati.

In this instance one of the "furthest north" of the heavy machine tool builders in the United States—the history of which goes back 90 years—acquires control of one of the "furthest south" builders of heavy machinery, whose founding took place 50 years ago. No removal of manufacturing facilities is contemplated in this case. The plants will be left intact but the engineering research and sales activities will be co-ordinated to the benefit of both.

This decision to maintain the two plants as independent entities not only is interesting but also is highly significant as a possible new trend in the heavy machine tool industry. During recent years there have been several similar mergers where manufacturing facilities have been combined. The result has been that heavy machine tool building gradually has become concentrated in a few centers.

This may have been logical from a managerial point-of-view, but the fact remains, that this phase of our country's national defense has been growing more and more vulnerable. One of the lessons which we had to learn "the hard way" during the early days of World War II, was that the heavy machinery industry—more or less taken for granted in peacetimes—becomes of tremendous importance when the security of our country is threatened.

In the early days of the recent war I came into close contact with certain high officers of the Army and the Navy whose job it was to get big machine tools quickly. Every one of them expressed admiration for those determined men who had kept this industry in "running condition."

I believe that Ralph Kraut and his associates are following a course which is for the good of our country—especially in these troubled times. It is a course which I am certain the late Hans B. Kraut, in his far-seeing way, would heartily approve of were he still in the land of the living.

NORTON'S WAR MEMORIAL: Of the many tributes by industrial organizations to those of their employees who died in the service and who served in their country and returned, one of the most impressive is a book entitled *Under Our Flag,* just published by Norton Co., Worcester, Mass.

This beautifully gotten-up book—which of course is a limited edition—features portraits of the 61 Norton men who gave their lives during World War II. These were done in charcoal by the well-known artist, Bettina Steinke—who in many instances had to work up these service portraits from old civilian snapshots, with the help of members of the families. In each case, Miss Steinke's originals were framed and presented to the next of kin by the Norton management.

In addition to those 61 who gave their lives, 2480 Norton employees served in the Army, Navy, Coast Guard and Merchant Marine. When it is considered that a large number of these were highly skilled people drawn from an organization whose products —both abrasives and machine tools—were of vital importance to the war production program, it becomes obvious that "The Norton Spirit" by no means was confined to the home front.

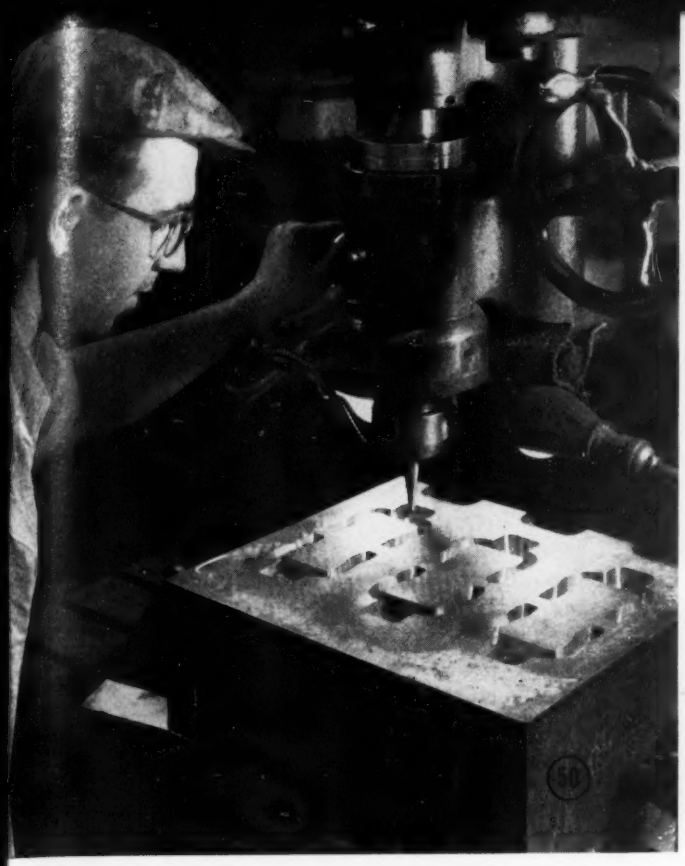


Fig. 50—Die sinker at work

Of the many factors important to the practical application of forging techniques, none is more essential than the correct construction of die blocks and tools. Selecting steels, laying out, sinking the impression, pouring the lead proof, shrink rules, finish machining are among the points discussed in considerable detail here

FUNDAMENTALS OF Forging Practice

By WALDEMAR NAUJOKS

IMPORTANCE of good die blocks for forging work should not be underestimated. Ability of the dies to hold impression shapes to close tolerances depends largely upon the strength and toughness of the die blocks. Considerable labor time is required to prepare the die blocks for their work in the drop hammer or in the forging machine, and this makes it doubly important that the die impressions wear very slowly so that many forgings can be made from them.

Making good die blocks is a specialized field of steelmaking and of forging. Most die blocks for production service are made from steels with special compositions, and are forged to develop the best possible properties for their service in drop hammers, forging machines or forging presses. The idea that cast steel forging dies, with the die impressions and the die shanks cast in the die blocks so as to save considerable machining and die sinking work, has been tried from time to time. It has been found that the "as cast" blocks do not take the impact pressure and tend to break, particularly if the impression is fairly deep. It has also been found that the die blocks do not have sufficient density of structure to develop good wearing qualities. Even on small production runs, the chance of breakage, of blowholes beneath the impressions, and considerable machine work did not make it practical to use cast steel dies.

Die impressions receive severe usage in forging work. In the drop hammer, the dies are subjected to heavy impact stresses, especially if the die impressions have deep pockets. Hot plastic metal is forced into these pockets with a wedging action which attempts to crack the dies; dies must be tough enough to resist the wedging action. Hot plastic metal also has an abrasive action on the impression surfaces and attempts to wear away the surface of the impression. The plastic metal which flows into the flash pan attempts to "wash away" the die walls. Die steel must resist this abrasive action to reduce impression wear as much as possible.

Generally, the die block is a large mass of steel compared to the piece of forging stock being forged in the dies. The contact of the hot forging stock tends to heat up the impression surface more rapidly than the main body of the die block can carry the heat away. The hot impression surface and the much cooler body causes uneven expansion in the die block and this tends to develop small surface cracks which grow larger as more pieces are forged.

The Die Block Steels—Several grades of steel are used for die block service. Toughest die block steel for general hammer and forging machine use is a steel using chromium, nickel and molybdenum as alloys and with a fairly high carbon content. Other grades with lesser alloys for less severe service are available. Plain carbon steel die blocks are also available,

Part VII of the current forging series

Previous articles in the current forging series appeared in the following issues of STEEL: June 7 p. 100, June 21 p. 98, July 5 p. 76, July 19 p. 99, Aug. 2 p. 91, Aug. 16 p. 94.

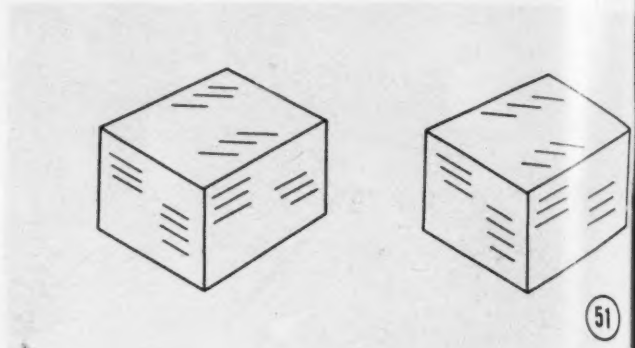
but their use is rather limited. Some die block makers manufacture their own steel and then forge it to size for die block use. Others buy their steel to their special steel specifications and then forge it into die blocks.

Die blocks are usually forged under large hydraulic forging presses, ranging in capacity from 1000 to 5000 tons forging pressure. The rectangular blocks are forged on all six faces with a considerable amount of working. It is important to develop the fine dense grain structure in the die blocks for use as forging die blocks. The heating, cooling, and heat treating of die blocks is very important. The large masses of steel must be heated very carefully in furnaces that are controlled exactly as to temperature and time of heating.

Regulated cooling of the blocks between heating is essential. Most die blocks are heat treated to their required hardness before they are machined, so that no further heat treatment is necessary after the blocks have been made into impression dies. It is more difficult to machine the hardened die blocks, but this eliminates possible cracking in the heat treatment later on. If die blocks are machined in the soft, or annealed, state, they must be hardened before they can be used. Heating the blocks with the impressions and then quenching them to develop hardness may crack the block so it cannot be used. There is also the possibility of warping the die impressions so that they must be remachined. Small blocks and die block inserts that are harder than can be machined are machined in the annealed state and then given the hardening treatment.

Hardness Grades—Heat treated die blocks can be obtained in several grades of hardness. The hardness requirement depends upon the size of the die block and upon the shape of the impression that will be machined in the block. The thinner and flatter the impression, the harder the block can be. As the depth of the impression increases, it becomes necessary to use blocks that are not so hard, but tougher. It is generally desirable to use a die block as hard as possible, provided it has sufficient toughness for the particular die impression.

A large variety of tool steels is available for use in making insert, trimmer, coining, forming, punching and ironing dies, and other tooling that may be necessary for use in making impression die forgings. These steels range from regular water-hardening carbon tool steel to the highly alloyed hot working tool steel. It is well to know that the experience of each shop must be used in making a selection of the grades required. Trimmer dies and the other dies are usually machined to shape in the soft or annealed state, then hardened and tempered, and ground to size for their work. It is the custom in many shops to use less expensive steels for the body of trimmer and punching dies and to weld some hard face alloy on the cutting edges for long life and good wear.



Preparing Die Blocks—Blocks as received by the die making department of the forging plant, are fairly rough in shape. When a set of dies is to be made, the first step is to prepare the die blocks for the impression machining. Several steps in making the impression dies for drop forging in the drop hammer will be considered. Die blocks range in weight from under 100 pounds each up to about 4000 pounds; it is therefore necessary to have some convenient means of handling these blocks easily and efficiently in the die department.

Blocks are first taken to a drill press where a set of handling holes are drilled in the blocks. For the smaller sizes of blocks, a hole at each end of the block is sufficient and for the larger blocks a set of holes at the ends and another set at the sides are desirable. There is no standard size of hole in the industry, each forge shop setting up its own standard. For a medium weight block a hole 1 inch in diameter is considered average. The holes are drilled from about 3 to 6 inches deep, to permit easy handling of the blocks by sling chains which have pins to fit the holes. Pins are inserted in the handling holes and the die block can be moved into any machine that may be desired.

Blocks are then taken to a planer for most die blocks, or to a shaper in the case of small blocks. A die block has two faces, impression face and shank face. The impression face is usually a bit harder than the shank face. The shank face is planed, taking off about ¼-inch of metal to be sure that a good sound clean surface is reached. Shanks of the dies are planed at the same setting. Blocks are turned over then and the impression face is planed, again taking off sufficient metal to insure a good sound surface.

Then two sides of the block at right angles to each other are planed for about 1 inch down from the impression face. The impression face and the shank face must be exactly parallel with each other. The impression face and the two side match faces must be exactly at right angles with each other, because all dimensions are taken from the impression face and

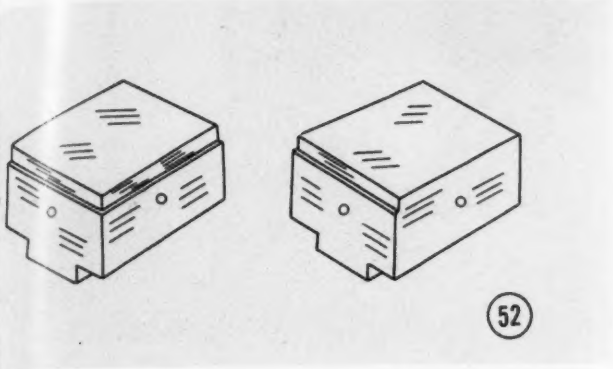


Fig. 51—Blank die blocks

Fig. 52—Blocks ready for sinking die impression. Shanks, face and match sides are planed and handling holes drilled

the match edges. It is important that when the impressions are machined into the die blocks, the top and bottom impressions coincide when the match lines are exactly in match.

Aligning Dies—When the dies are fitted into the hammer, they are aligned by maching the front and side match edges. It is also important that the shanks are exactly parallel with the impression faces, for if they are not parallel, the impression faces will not be parallel after the shanks have been keyed tightly in the hammer. There is no general rule among the forging industry as to which side the match edges are machined. Each shop, however, places the match edges on the same side for all of their dies.

Where the dies are of the lock type, that is, where there are two or more impression face planes, they may be machined complete with locks in the planer, or they may be taken from the planer to a shaper for the locking. Where locks are required, they are usually machined on the die blocks before impression machining is started. Fig. 51 shows blank die blocks. Handling holes in the blocks and the planed shanks planed on can be seen in Fig. 52.

Laying Out Finishing Impression—Next step is to lay out the finishing impression on the impression faces of the pair of dies. Some types of drop forgings require the use of templates and where templates are required, they are usually made during the time blocks are on the planer. Section templates are made from thin sheet steel; outline of the template corresponds to the outline of the die impression at a given section. Their use will be mentioned later. It is generally desirable to have the final or finishing impression in the center of the die blocks in both directions, that is, halfway from front to back and half way from side to side.

With the finishing impression centered in the die blocks, there is a minimum of side thrust or end thrust to the dies when they are being used for forging in the finishing impression. Reducing the side or end thrust reduces the possibility of making die-shifted forgings where the top half of the forging is not lined up with the bottom half.

Layout on the die faces consists of putting a coating of blue or brown on the face so as to cover up the silverlike surface which has been planed. Outline of the finishing impression is marked on the die face with a steel point called a scriber, which scratches through the blue coating to show up the lines in a silverlike color. After the outline of the forging has been scribed, it is further marked with a series of light prickpunch marks, so that all of the lines are easily found and recognized.

Diesinking—From the layout bench the die blocks are transferred to a vertical type milling machine known as the diesinking machine. This tool is used to remove metal from the die face to form the cavity in the dies in the shape of the forging. Roughing cutters remove most of the metal to form the cavity, leaving just enough for the finishing cutters to get the exact size of the impression cavity. It is important that the die cavities are extremely smooth. As much of the work as possible is done in the diesinking machine. Fig. 50 shows a diesinker machining an impression.

Upon completion of the work at the diesinking machine, the die blocks are transferred to a bench for the benchwork which consists of scraping, filing, and polishing. These operations remove all little rough spots and polish the impression so that all traces of tool marks are removed. Any tool mark left in the drop forging die impressions usually appears on the drop forging, so it is important that the impression surfaces are lapped and polished smooth. Fig. 53 illustrates bench work. For bench work, the die block generally rests on a swivel base, so that the block can be rotated and positioned easily by hand, to the best advantage for the particular bit of work to be done.

When a drop forging is symmetrical in nature, such as a ring forging, or a gear blank, it is possible to machine the die impression in a heavy lathe or in a boring mill. Modern machines are designed to make use of templates and models to develop the impression cavities automatically. Some machines have oscillating heads so half circles can be machined along the horizontal plane to develop impression cavities for shafts and similar round forgings where the axis of the part is parallel to the face of the dies.

Die blocks are held in place on the various machines by the use of a vise for small die blocks and by means of dogs on the medium and large die blocks. In addition to the finishing impression, a sprue is machined in the dies. This is used to connect the forging with the bar or with a tonghold. The tonghold is a small piece of metal extending out from the forging proper. It is used to hold forging stock while it is being worked in the various forging impressions.

G&F Giant Grip GL GM

Checking Dies—Progress of the impression cavity is checked from time to time. In addition to the usual calipers, gages and similar measuring devices used by toolmakers, it may be desirable or necessary to use section templates. Made of thin sheet steel, these templates have the contour of a given section so that the template can be placed in position at the particular section to determine if the dimensions are correct or nearly so. Templates are used for sections that are not readily and easily measured by ordinary means.

Another measuring device is the "type". Types are hardened steel blocks machined and ground to the exact shape of a deep cavity or an irregular cavity that is not easily measured by the regular measuring instruments or by templates. When the portion of the die to be measured by the type appears to be just about right, the type is covered with prussian blue or a similar material and inserted in the cavity to be measured. It is struck sharply with one or more hammer blows and then removed. If the type has an even bearing all around, the entire cavity that is being typed will show blue. If there are "high spots", places where not quite enough metal has been removed, these spots will show blue while the rest of the cavity does not. The high spots are removed and the cavity is again typed. This is continued until the type indicates that the cavity is exactly right.

Pouring — After final or finishing die impressions have been completed, and the measurements with the regular instruments, templates, and types indicate that the finishing impression is to the correct size and shape, the dies are removed from the bench and taken to the floor space provided for pouring a lead cast. Dies are placed on the floor with the impression faces together. The faces are lined up exactly with the match edges and then are clamped tightly together, with the sprue opening on top.

Molten die metal, usually composed of some alloy with a high percentage of lead, is poured into the sprue until the die impression and the sprue are filled. The die metal is allowed to cool and become solid, after which the clamps are removed and the die metal casting is taken from the impression. The casting is usually called a "lead cast" or a "lead proof". This lead proof is carefully checked for dimensions. If the shop measurements indicate that the dimensions as shown by the lead proof are correct, the lead proof is sent to the customer for his checking and approval. The customer checks the lead cast and submits his approval or comments. If the shop measurements indicate some errors in the lead proof, the dies are returned to the die department for the correction of the errors.

Shrink Rules—All of the measurements used for die sinking work are taken from shrink rules, to allow for the contraction of the hot forging when it is finished. It is known that all metals expand when they are heated and the higher they are heated, the more they expand. When a forging is made, the finishing temperature may be around 1700 to 1800°F and when it has cooled to normal room temperature, the forging is a little smaller than it was when it left the finishing die impression at the red hot temperature. So it is necessary to make the die impressions slightly larger to allow for this shrinkage. Average allowance for shrinkage in steel forgings is 3/16-inch per foot.

Fig. 53—Bench work on drop forging dies

In other words, if the forging should be exactly 12 inches long, the die impression will be machined 12 3/16-inches long. The forging leaving the die impression right after the final blow of the hammer is 12 3/16-inches long, but when it has cooled to room temperature, it has shrunk so that it is 12 inches long. For some kinds of drop forgings, it may be necessary to vary from the standard shrinkage allowance because of some special condition which prevents normal shrinkage, or because of a metal with different ratio of shrink.

It is also possible that a lead cast may not be able to shrink in a normal manner even though the forging to be made from the dies is able to shrink normally. For instance, plugs in the dies may prevent the lead cast from shrinking normally whereas when the forging is finished, it will cool off on the floor or in the tote box to shrink normally. In such a case, allowance is made when the lead cast is being measured. Whenever there appears to be an error that might be caused by lack of normal shrink in the lead cast, the die impressions are again checked very carefully.

Die Blocks Machined—After the finishing impression has been finished and approved, die blocks are returned to the necessary machines for machining in the flash pan and gutter. The flashpan is the narrow space which permits excess metal in the forging to spread outward and the gutter is the space for the excess metal to go. The flashpan and gutter are machined around the perimeter of the finishing impres-

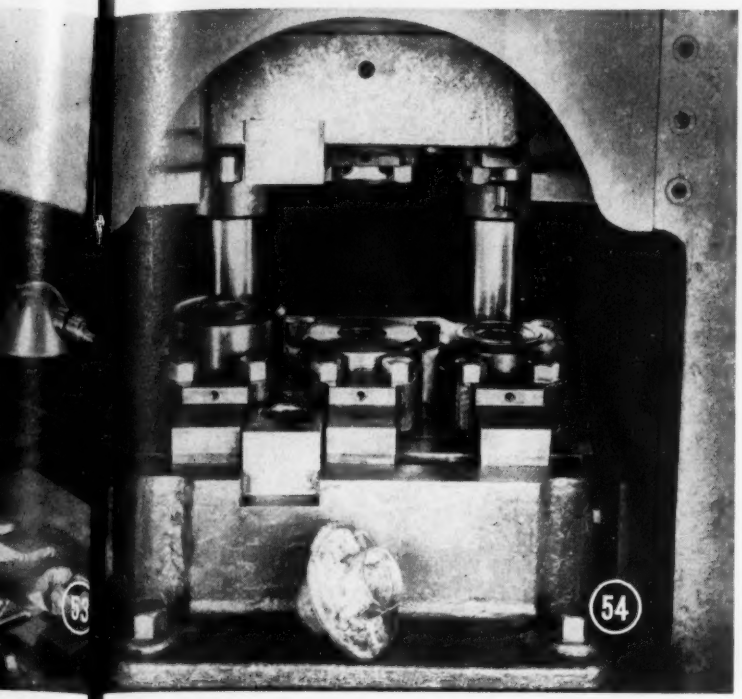


Fig. 54—Press forging dies. Courtesy National Machinery Co., Tiffin, O.

sion on one of the dies.

Then the preliminary forging impressions are machined in the dies, if preliminary forging steps are needed. On simple forgings, it may not be necessary to provide preliminary forging steps, and the forging stock is placed directly into the finishing impression. On some impression forging dies, it may be necessary only to provide a flattening space where the forging stock is pancaked before it is placed in the finishing impression. However, if preliminary forging steps are required, such as the edger, fuller, blocking impression, or bending impression, they are machined in the die blocks.

For some forgings, cutoff blades are provided, either by machining them at one corner of the die blocks, or by inserting them in slots in the die blocks. On the shank side, it is necessary to mill in the dowel pocket, if this has not been done. The dowel is a block of steel, half of which fits in the dowel pocket in the die; the other half fits in the dowel pocket of the hammer ram or in the anvil cap. It prevents the dies from moving out of alignment from the front to back position.

After the dies have been completed, they are ready for use in the drop forging hammer, provided they have been made from a regular heat treated die block. If the dies are made out of blocks in the soft or annealed state, the machining and diesinking work proceeds up to the point where grinding and polishing is necessary. Dies are then heat treated to the desired hardness. After heat treatment, they are taken to the bench for lapping and polishing. Any irregularities due to die warpage or scaling in the heat treating of the dies are also corrected.

Since die cavities grow larger during the drop forging operations, die impressions are machined to the smallest permissible size, in order to obtain maximum die wear from the impressions. For each forging, the impression becomes slightly larger. When the impression is worn to a point where the forging is larger than the largest permissible dimensions, the impression is considered worn out, and the dies are returned to the die department. Here the worn out impression is planed off, and a new impression machined into the die blocks. Number of recuttings a set of dies can be given, depends upon the shape and depth of the die impression cavity. Some dies can be recut three, four, or five times while others can be recut only once or twice. Some dies with very deep cavities cannot be recut at all.

Trimming Tools—For most drop forgings, it is necessary to make a set of trimming dies as well as a set of drop forging dies. The trimming dies, or trimming tools, are used to shear away excess metal on the drop forging. This excess metal, in the form of a thin plate around the perimeter of the die parting line, is termed "flash". Trimming tools usually consist of shear blades and a trimming punch. Trimming blade or blades are flat plates with an opening that is the outline of the forging at the die parting line.

Usual practice is to fasten the trimming blades in a steel shoe which rests on the bedplate of the trimming press. The trimming punch is machined to the outline of the opening in the trimming blades and to a size that permits it to pass through the blades. The pushing face of the punch is machined to the contour of the top surface of the forging, so that the punch has an even bearing on the forging. The drop forging is placed on the trimmer blades with the forging directly over the opening of the blades and the flash resting on the trimmer blades. When the press is started, the trimmer punch moves downward and pushes the forging through the trimmer blades so that the flash is sheared away from the drop forging.

If the trimmer punch does not have an even bearing throughout the length and width of the drop forging, it may bend the forging out of shape. This is particularly true if the forging is thin or fairly long. The trimming operation may be hot or cold. For small forgings under 5 pounds, in low carbon steel and in some low carbon alloy steels, the trimming may be a cold trimming operation. For medium forgings up to about 50 pounds, and large sized drop forgings over 50 pounds, trimming away the flash is usually a hot operation. In hot trimming, the drop forgings usually have enough heat in them to perform the trimming operation without reheating. Trimming blades are made in one piece, two or more pieces, depending on the size and shape of the drop forging to be trimmed.

Punching Tools—Some drop forgings require a set of tools for punching out holes in the forgings. The punching tools can vary from a simple loose punch to a set of elaborate punchout tools. On some simple holes, it is possible to provide a steel punch of the right diameter and of sufficient length to clear the top of the drop forging. The forging is placed in the press on a flat plate with a hole sufficiently

large for the slug being punched out, to go through. A flat die in the ram of the press pushes the punch through the forging to cut away the thin slug.

This loose punch is handled by a pair of tongs to place it in position, and to pick it up from the bottom of the punchout shoe. On drop forgings requiring one or more holes, the punches are fixed tightly in the ram of the press to perform the punching operation. If the bottom shape of the drop forging is irregular, it is necessary to make a holder in which the forging can rest in the proper position for the punching operation. The kind of punchout tools necessary for the drop forging depends upon the production requirements. In some instances it is possible to use simple punching tools and in other instances it is necessary to make more elaborate punching tools.

Some drop forgings require trimming and punching where it is desirable to make combination tools; that is, the trimming and punching operations are performed at the same time in one stroke of the press. The combination tools are used where production requirements are sufficient to make it worth while to build the combination set of trimming and punching tools.

Forging Machine Dies—Dies and tooling for use in forging machines are somewhat different from the tooling used for drop forging operations. The forging machine is essentially a forging press that works in the horizontal position, and that is double acting in nature. Since the forging machine is virtually a forging press, the dies are clamped into position instead of being wedged into position by keys.

First step in preparing die blocks for the forging machine is to plane the pair of blocks on all six sides of each block, making sure that all sides are at right angles with all adjacent sides. It is important to make the blocks to the right thickness so that they will fit together tightly when closed but without excessive pressure. Blocks are marked up in the layout process similar to the layout of a set of drop forging dies. It is important that the forging passes or steps are designed in accordance with good forging machine practice, particularly in not trying to do too much in one pass. Die sinking steps and the various machining operations on the die blocks and on the header punches are performed in a manner similar to those performed on drop forging dies and tooling. Care must be taken to develop close fitting forg-

(*Please turn to Page* 86)

Cutting Tool and Die Materials

THIRD OF A
SEVEN SECTION SERIES

This information on cutting tool and die materials prepared by the editors of STEEL lists factors to be considered in the quick selection of tool steels and carbide types to meet any given requirement. Sources, trade names and applications are conveniently presented. Other pertinent data include chemical analyses, heat treatments, quenching media, movement in hardening and machinability as annealed

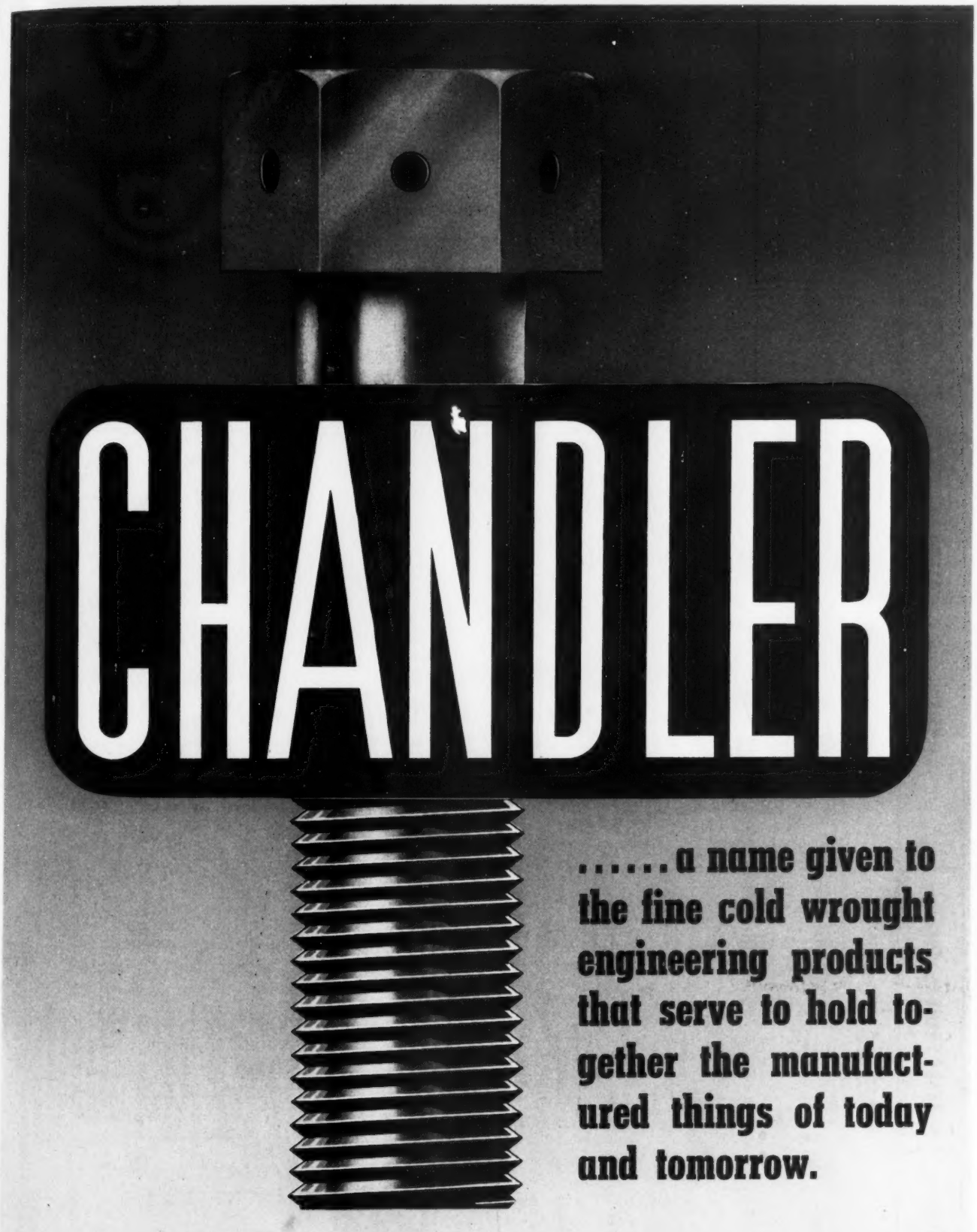
CARPENTER STEEL CO., 339 West Bern St., Reading, Pa. — Listing No. 12

PRIMARY APPLICATION	TRADE NAME & TYPE	ANALYSIS (%)	SUGGESTED TEMPERATURE RANGES (°F) Forging	Finish Forging	Annealing	Preheating	Hardening	Tempering	Quenching Medium. * % Machinability Annealed. Movement in Hardening.
Cold Work Dies (Blanking)	SPEED STAR High Speed, Hot Work Tool Steel	C .82, Mn .25, Cr 4.25, W 6.25, Mo 5.00, V 1.90, Si .25	1950–2050	1800	1550–1600	1475–1500	2150–2275	1025–1050	Oil Mach. 45 Movement +A
Cold Work Dies (Blanking)	STAR COLUMBIUM High Speed	C .80, Cr 4.25, W 5.50, Mo 4.50, V 1.50, Cb 1.25	1950–2050	1800	1550–1560	1500–1550	2250–2350	1000–1025	Oil Mach. 45 Movement +A
Cold Work Dies (Blanking)	STAR-ZENITH High Speed, Hot Work Tool Steel	C .72, Mn .25, Cr 4.00, W 18.25, V 1.15, Si .20	1950–2050	1600	1550–1600	1500–1600	2300–2400	1025–1100	Oil Mach. 45 Movement +A
Cold Work Dies (Cold Forming)	H-9 EXTRA Water Hardening	C .90, Mn .40, Si .40	1950	....	1350	....	1525–1575	425–475	Water Mach. 100 Movement ±C*
Cold Work Dies (Cold Forming)	SOLAR Water Hardening	C .50, Mn .40, Mo .50, Si 1.00	2100	....	1350–1400	....	1550	300	Water Mach. 75 Movement ±C*
Cold Work Dies (Blanking, Cold Forming)	HAMPDEN Oil Hardening	C 2.10, Mn .25, Cr 12.50, Si .25, Ni .50	1925–2000	1700	1550–1575	....	1750–1800	400	Oil Mach. 50 Movement +A
Cold Work Dies (Blanking, Cold Forming)	K-W Water Hardening	C 1.30, Mn .30, W 3.50, Si .30	1950	....	1440–1460	....	1525–1600	350	Water Mach. 80 Movement —C
Cold Work Dies (Blanking, Cold Forming)	NO. 11 SPECIAL Water Hardening	C 1.05, Mn .20, Si .20	1950	....	1350–1375	....	1450–1500	350	Water Mach. 100 Movement ±C*
Cold Work Dies (Blanking, Cold Forming)	NO. 484 Air Hardening	C .95, Mn .70, Cr 5.00, Mo 1.00, V .20, Si .20	1950–2050	1700	1550–1575	....	1725–1775	400	Air Mach. 70 Movement +A
Cold Work Dies (Blanking, Cold Forming)	NO. 610 Air Hardening	C 1.50, Mn .30, Cr 12.00, Mo .80, V .20, Si .30	1925–2000	1700	1550–1575	....	1825–1875	450	Air Mach. 50 Movement +A
Cold Work Dies (Blanking, Cold Forming)	R. D. S. Oil Hardening	C .75, Mn .35, Cr 1.00, Si .25, Ni 1.75	2000	....	1400–1450	....	1500–1550	300	Oil Mach. 75 Movement +A
Cold Work Dies (Blanking, Cold Forming)	STENTOR Oil Hardening	C .90, Mn 1.60, Si .25	1950	....	1330–1350	....	1420–1470	375	Oil Mach. 100 Movement +A
Cold Work Dies (Blanking, Cold Forming)	VEGA Air Hardening	C .70, Mn 2.00, Cr 1.00, Mo 1.35, Si .30	2025	....	1350–1375	....	1525–1600	350	Air Mach. 80 Movement +A
Cutting Tools (Finishing)	K-W	(Listed Above)							
Cutting Tools (Roughing, Finishing)	(See SPEED STAR, STAR COLUMBIUM, STAR-ZENITH, Listed Above)								
Die Casting Dies	NO. 883 Hot Work Tool Steel	C .40, Mn .35, Cr 5.00, Mo 1.35, V .90, Si 1.10	2000–2075	1650	1600–1625	....	1850–1875	(†)	Oil, Air Mach. 65 Movement ±B*
Gages	CASE-HARDENING Thread Gage Steel Oil Hardening	C .20, Mn 1.30, Si .20	1950–2050	....	1330–1350	....	1450	300	Oil Mach. 100 Movement +A
Gages	(See HAMPDEN, No. 11 SPECIAL, No. 484, No. 610, STENTOR, Listed Above)								
High-Stress, High Wear Machinery Parts	(See CASE HARDENING THREAD GAGE STEEL, R.D.S., Listed Above)								
Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing)	T-K Hot Work Tool Steel	C .35, Mn .30, Cr 3.50, W 9.00, V .40, Si .30	2000–2050	1600	1550–1600	1500–1550	2150–2200	(†)	Oil, Air Mach. 55 Movement ±B*
Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing)	NO. 883	(Listed Above)							
Hot Work Dies (Hot Punching, Hot Shearing)	(See SPEED STAR, STAR-ZENITH, Listed Above)								
Plastic Molding Dies (Ejector Pins)	(See No. 11 SPECIAL, SOLAR, STENTOR, Listed Above)								
Plastic Molding Dies (Hubs)	NO. 484	(Listed Above)							
Plastic Molding Dies (Hubbed Cavity Dies)	MIRROMOLD Water Hardening	C .10, Mn .20, V .10	2100	....	1600	....	1425–1450	300	Water Movement ±B*
Plastic Molding Dies (Hubbed Cavity Dies)	SAMSON No. 1 Water, Oil Hardening	C .10, Mn .50, Cr .60, Ni 1.25	2050	....	1475	....	1450	300	Oil, Water Movement ±A, ±B*
Plastic Molding Dies (Machine Cut Cavity Dies)	NO. 158 Oil Hardening	C .10, Mn .40, Cr 1.50, Ni 3.50	2050	....	1250	....	1450	300	Oil, Air Movement +B, +A
Plastic Molding Dies (Machine Cut Cavity Dies)	SAMSON No. 2 Water, Oil Hardening	C .15, Mn .50, Cr .60, Ni 1.25	2050	....	1475	....	1450	300	Oil, Water Movement ±A, ±B*
Plastic Molding Dies (Machine Cut Cavity Dies)	STENTOR	(Listed Above)							
Plastic Molding Dies (Hubs Cavity Dies, Machine Cut Cavity Dies)	STAINLESS M. S. No. 2 Oil, Air Hardening	C .30, Cr 13.00	2100	....	1450	....	1800–1850	400–500	Oil, Air Movement ±B, ±A*
Plastic Molding Dies (Machine Cut Cavity Dies, Hubs)	R. D. S. Oil Hardening	(Listed Above)							
Plastic Molding Dies (Machine Cut Cavity Dies, Hubs, Ejector Pins)	VEGA	(Listed Above)							
Punching and Shearing	(See HAMPDEN, H-9 EXTRA, No. 11 SPECIAL, No. 484, No. 610, R.D.S., SOLAR, STENTOR, VEGA, Listed Above)								
Shock Resisting (Repeated, Intermittent Impact)	(See R.D.S., SOLAR, VEGA, Listed Above)								

† To temperature reached in service. * Plus or minus—depending on size and shape of section.

PRIMARY APPLICATION	TRADE NAME & TYPE	ANALYSIS (%)	SUGGESTED TEMPERATURE RANGES (°F)						Quenching Medium. ★ % Machinability Annealed. Movement in Hardening.
			Forging	Finish Forging	Annealing	Preheating	Hardening	Tempering	
COLUMBIA TOOL STEEL CO., Chicago Heights, Ill.									**Listing No. 13**
Cold Work Dies (Blanking, Cold Forming)	ATMODIE Air Hardening, High Carbon, High Chrome	C 1.50, Mn .30, Cr 12.00, Mo .80, V .90, Si .35	1950	1600	1650	1250	1800–1850	400–600	Air Movement A
Cold Work Dies (Blanking, Cold Forming)	CLARITE Oil, Air Hardening, High Speed	C .72, Mn .25, Cr 4.00, W 18.00, Mo .60, V 1.15, Si .30	2150	1700	1650	1100–1600	2200–2350	1050	Oil Movement C
Cold Work Dies (Blanking, Cold Forming)	EXLDIE Oil Hardening, Non-Deforming	C .90, Mn 1.15, Cr .50, W .50, Si .25	1900	1500	1450	1200	1480–1525	300–400	Oil Movement B
Cold Work Dies (Blanking, Cold Forming)	EXTRA Water Hardening	C 1.00, Mn .25, Si .20	2000	1500	1450	1200	1425–1500	300–550	Water Movement C
Cold Work Dies (Blanking, Cold Forming)	MOLITE Oil, Air Hardening, High Speed	C .82, Mn .25, Cr 4.15, W 6.50, Mo 5.00, Co 1.90, Si .30	2000	1600	1600	1100–1500	2100–2225	1050	Oil Movement C
Cold Work Dies (Blanking, Cold Forming)	OILDIE Oil Hardening, Non-Deforming	C .95, Mn .65, Cr 1.60, W .50, Si .35	1900	1550	1550	1200	1500–1550	300–450	Oil Movement B
Cold Work Dies (Blanking, Cold Forming)	SPECIAL Water Hardening	C 1.00, Mn .25, Cr .15, V .04, Si .25	1900	1500	1450	1200	1420–1500	300–500	Water Movement C
Cold Work Dies (Blanking, Cold Forming)	SUPERDIE Oil, Air Hardening, High Carbon, High Chrome	C 2.10, Mn .30, Cr 10.50, W .80, Si .90	1900	1600	1650	1250	1700–1750	300–1000	Oil, Air Movement A
Cutting Tools (Finishing)	VANITE High Speed	C .82, Mn .25, Cr 4.25, W 18.50, Mo .70, V 2.15, Si .30	2150	1700	1650	1100–1600	2300–2350	1050	Oil Movement C
Cutting Tools (Roughing)	MAXITE Cobalt High Speed	C .73, Mn .25, Cr 4.00, W 14.00, Mo .60, V 2.15, Co 4.75, Si .30	2150	1700	1650	1100–1600	2325–2375	1050	Oil Movement C
Cutting Tools (Finishing, Roughing)	(See CLARITE, MOLITE, Listed Above)								
Die Casting Dies	CASTDIE Air Hardness, Heat Resisting	C .35, Mn .35, Cr 5.25, Mo 1.35, V .50, Si .95	2100	1650	1530	1400–1500	1800–1850	1000–1200	Air Movement A
Die Casting Dies	EXLDIE (Listed Above)								
Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing)	BUSTER Oil Hardening, Shock Resisting	C .60, Mn .30, Cr 1.20, W 2.15, V .25, Si .70	1900	1600	1500	1200	1650–1750	600–1000	Oil Movement A
Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing)	FIREDIE Air Hardening, Heat Resisting	C .35, Mn .35, Cr 5.25, Mo 1.35, V .50, Si .95	2100	1650	1530	1400–1500	1800–1850	1000–1200	Air Movement A
Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing)	FORMITE High Speed, Heat Resisting	C .35, Mn .25, Cr 4.00, W 13.50, Mo .40, V .35, Si .35	2000	1600	1600	1100–1600	2150–2250	1050–1300	Oil, Air Movement B
Plastic Mold Dies	(See ATMODIE, BUSTER, EXLDIE, OILDIE, SUPERDIE, Listed Above)								
Punching, Shearing	(See ATMODIE, BUSTER, CLARITE, EXLDIE, EXTRA, MOLITE, OILDIE, SPECIAL, SUPERDIE, Listed Above)								
Shock Resisting (Repeated, Intermittent Impact)	EXTRA HEADER DIE Water Hardening	C .95, Mn .35, Si .25	2000	1500	1450	1200	1475–1550	300–600	Water Movement C
Shock Resisting (Repeated, Intermittent Impact)	VANADIUM EXTRA Water Hardening	C .95, Mn .25, V .20, Si .25	2000	1500	1450	1200	1450–1500	300–600	Water Movement C
Shock Resisting (Repeated, Intermittent Impact)	(See BUSTER, EXTRA, SPECIAL, Listed Above)								
CRUCIBLE STEEL CO. OF AMERICA, 405 Lexington Ave., New York 17, N. Y.									**Listing No. 14**
Cold Work Dies (Blanking)	AIRDI 150 Air Hardening	C 1.50, Cr 11.50, Mo .80, V .20	1900–2000	1650	1650	1450	1800	450	Air
Cold Work Dies (Blanking)	AIRKOOL Air Hardening	C 1.00, Mn .40, Cr 5.25, Mo 1.15, V .40	1900–2000	1650	1650	1450	1800	450	Air
Cold Work Dies (Blanking)	CHAMPION NON-CHANGEABLE Oil Hardening	C .90, Mn 1.25, Cr .50, W .50	1800–1900	1550	1450	1250	1475	450	Oil
Cold Work Dies (Blanking)	HYCC Air Hardening	C 2.25, Cr 11.50, Mo .80, V .20	1900–2000	1650	1650	1450	1800	450	Air
Cold Work Dies (Blanking)	KETOS Oil Hardening	C .90, Mn 1.25, Cr .50, W .50	1800–1900	1550	1450	1250	1475	450	Oil
Cold Work Dies (Cold Forming)	ALVA EXTRA Water Hardening	C .95, V .20	1800–1900	1475	1400	....	1450	450	Water, Brine
Cold Work Dies (Cold Forming)	ATHA PNEU Oil Hardening	C .50, Cr 1.25, W 2.75, V .20	1800–1900	1650	1450	1450	1750	800	Oil
Cold Work Dies (Cold Forming)	CRESCENT SPECIAL Water Hardening	C 1.05	1800–1900	1475	1400	....	1450	450	Water, Brine
Cold Work Dies (Cold Forming)	LaBELLE EXTRA Water Hardening	C .95	1800–1900	1475	1400	....	1550	450	Water, Brine
Cold Work Dies (Cold Forming)	LaBELLE SILICON #2 Water Hardening	C .60, Mn .75, Cr .25, Mo .30, Si 1.90	1900–2000	1550	1425	1250	1600	750	Water

★ Last column indicates suggested Quenching Medium; Machinability Annealed using base 100 for carbon and low alloy steels; and Movement in Hardening by "A" for slight, "B" for intermediate, "C" for considerable movement—"+" denotes expansion, "—" denotes contraction.



.....a name given to the fine cold wrought engineering products that serve to hold together the manufactured things of today and tomorrow.

CHANDLER PRODUCTS CORP.
1491 CHARDON RD. CLEVELAND 17, OHIO

PRIMARY APPLICATION	TRADE NAME & TYPE	ANALYSIS (%)	SUGGESTED TEMPERATURE RANGES (°F)						Quenching Medium. ★ % Machinability Annealed. Movement in Hardening.
			Forging	Finish Forging	Annealing	Preheating	Hardening	Tempering	
Cold Work Dies	LaBELLE COLD STRIKING DIE	C .95	1800–1900	1475	1400	....	1450	450	Water, Brine
Cold Work Dies (Cold Forming)	SANDERSON EXTRA Water Hardening	C 1.05	1800–1900	1475	1400	....	1450	450	Water, Brine
Cold Work Dies (Cold Forming)	AIRKOOL	(Listed Above)							
Cutting Tools (Finishing)	REX SUPERVAN High Speed	C .85, Cr 4.00, W 18.50, Mo .75, V 2.10	1900–2000	1700	1650	1500–1550	2350	1050	Oil, Air, Liquid Bath
Cutting Tools (Roughing)	REX AA High Speed	C .73, Cr 4.00, W 18.00, V 1.10	1900–2000	1700	1650	1500–1550	2375–2350	1050	Oil, Air, Liquid Bath
Cutting Tools (Roughing)	REX AAA High Speed	C .75, Cr 4.00, W 18.00, Mo .75, V 1.15, Co 5.00	1900–2000	1700	1650	1500–1550	2375–2350	1050	Oil, Air, Liquid Bath
Cutting Tools (Roughing)	REXALLOY Cast Alloy	C 2.25, Cr 33.00, W 17.00, Co 44.00							
Cutting Tools (Roughing)	REX M-2 High Speed	C .83, Cr 4.15, W 6.40, Mo 5.00, V 1.90	1850–1950	1700	1600	1400–1500	2250	1050	Oil, Air, Liquid Bath
Cutting Tools (Roughing)	REX SUPERCUT High Speed	C .77, Cr 4.00, W 18.50, Mo .65, V 2.00, Co 8.00	1950–2050	1700	1650	1500–1550	2375	1075	Oil, Air
Cutting Tools	REX 95 High Speed	C .80, Cr 4.00, W 14.00, Mo .75, V 2.00, Co 5.25	1900–2000	1700	1650	1500–1550	2375	1050	Oil, Air, Liquid Bath
Die Casting Dies (Aluminum Base)	NU DIE V	C .40, Cr 5.00, Mo 1.35, V 1.10, Si 1.05	1900–2000	1650	1625	1400–1500	1800	1100	Air
Die Casting Dies (Brass, All Parts)	PEERLESS A Oil Hardening	C .28, Cr 3.25, W 9.00, V .25	1950–2050	1700	1650	1550	2150	1175	Oil, Air
Die Casting Dies (Cylinder Liners)	NU DIE V	(Listed Above)							
Die Casting Dies (Lead, Magnesium, Tin or Zinc Base)	(See NU DIE V, REX AA, Listed Above)								
Die Casting Dies	REX AA	(Listed Above)							
Gages (Flat)	CRESCENT TOOL SHEET Water Hardening	C 1.00	1800–1900	1475	1400	....	1450	300–450	Water, Brine
Gages (Flat)	(See KETOS, REX AA, Listed Above)								
Gages (Plug)	(See AIRKOOL, HYCC, KETOS, REXALLOY, Listed Above)								
Gages (Snap)	(See AIRKOOL, CRESCENT SPECIAL, HYCC, REXALLOY, Listed Above)								
Gages (Thread)	See HYCC, REX AA, REXALLOY, Listed Above)								
Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing)	CHRO-MOW Oil Hardening	C .30, Cr 5.00, W 1.25, Mo 1.35, Si 1.00	1900–2000	1650	1625	1450	1850	1100	Air
Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing)	HALCOMB 218 Oil Hardening	C .40, Cr 5.00, Mo 1.35, V .35, Si 1.05	1900–2000	1650	1625	1450	1800	1100	Air
Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing)	(See AIRDI 150, ATHA PNEU, PEERLESS A, Listed Above)								
Plastic Molding Dies (Ejector Pins)	NU DIE V	(Listed Above)							
Plastic Molding Dies (Hubs)	(See AIRDI 150, AIRKOOL, ATHA PNEU, KETOS, LaBELLE SILICON #2, Listed Above)								
Plastic Molding Dies (Hubbed Cavity)	CRUSCA COLD HUBBING Water, Oil Hardening	C .05, Mn .15	1900–2000	1400	1650	§	1450	350	Oil, Water
Plastic Molding Dies (Hubbed Cavity)	FORMOLD Oil Hardening	C .07, Mn .40, Cr 1.35, Mo .20, Ni .55	1900–2000	1500	1450	§	1525	350	Oil
Plastic Molding Dies (Hubbed Cavity)	HOBALLOY Oil Hardening	C .07, Mn .50, Cr .65, Ni 1.25	1900–2000	1500	1440	§	1500	350	Oil
Plastic Molding Dies (Machine Cut Cavity)	CRUSCA 12B Oil Hardening	C .10, Mn .50, Cr 1.60, Ni 3.50	1900–2000	1500	1450	§	1475	300	Oil
Plastic Molding Dies (Machine Cut Cavity)	HALVAN Oil Hardening	C .45, Mn .70, Cr 1.00, V .20	1900–2000	1650	1425	1250	1650	600	Oil
Plastic Molding Dies (Machine Cut Cavity)	PLASTIC CSM #2 Oil Hardening	C .30, Mn .75, Cr .80, Mo .25, Si .50	1900–2000	1650	1425	1250	1550	450	Oil
Plastic Molding Dies (Machine Cut Cavity)	(See AIRKOOL, CHAMPION NON-CHANGEABLE, KETOS, NU DIE V, Listed Above)								
Punching and Shearing	(See AIRDI 150, AIRKOOL, ALVA EXTRA, ATHA PNEU, CHAMPION NON-CHANGEABLE, HALVAN, KETOS, LaBELLE SILICON #2, REX AA, REX M-2, Listed Above)								
Shock Resisting (Intermittent Impact)	ALVA EXTRA	(Listed Above)							
Shock Resisting (Repeated Impact)	BLACK DIAMOND Water Hardening	C .95	1800–1900	1475	1400	....	1450	450	Water, Brine
Shock Resisting (Repeated Impact)	LaBELLE SILICON #2	(Listed Above)							
Shock Resisting (Repeated, Intermittent Impact)	(See ATHA PNEU, HALVAN, Listed Above)								

§ Carburize 1650° F.

How can you possibly beat Bundyweld* for refrigeration tubing?

BUNDYWELD BENDS, CUTS AND JOINS EASILY AND QUICKLY
ITS DOUBLE-WALLED CONSTRUCTION MEANS THINNER WALLS, FASTER COOLING—YET NO LOSS OF STRENGTH

This two-temperature domestic refrigerator uses Bundyweld tubing in both freezer and food storage compartments.

No wonder it's so popular throughout the industry for condenser and evaporator coils, compressor and connecting lines!

Bundyweld is double-walled *from a single strip of metal*—a patented construction exclusive with Bundyweld. It's bonded *through 360° of wall contact*, allowing its walls to be thinner, *cool faster*. It's easy to cut, join, or bend to short-radius turns without fear of breakage.

Why not talk it over with your Bundy representative or distributor? Or give us a call: *Bundy Tubing Co., Detroit 14, Michigan.*

BUNDY TUBING

ENGINEERED TO YOUR EXPECTATIONS

*REG. U.S. PAT. OFF.

WHY BUNDYWELD IS BETTER TUBING

1 Bundyweld Tubing, made by a patented process, is entirely different from any other tubing. It starts as a single strip of basic metal, coated with a bonding metal.

2 This strip is continuously rolled twice laterally into tubular form. Walls of uniform thickness and concentricity are assured by close-tolerance, cold-rolled strip.

3 Next, a heating process fuses bonding metal to basic metal. Cooled, the double walls have become a strong ductile tube, free from scale, held to close dimensions.

4 Bundyweld comes in standard sizes, up to 5/8" O.D., in steel (copper or tin coated), Monel or nickel. Special sizes can be furnished to meet your requirements.

Bundy Tubing Distributors and Representatives: *Cambridge 42, Mass.:* Austin-Hastings Co., Inc., 226 Binney St. • *Chattanooga 2, Tenn.:* Peirson-Deakins Co., 823-824 Chattanooga Bank Bldg. • *Chicago 32, Ill.:* Lapham-Hickey Co., 3333 W. 47th Place • *Elizabeth, New Jersey:* A. B. Murray Co., Inc., Post Office Box 476 • *Philadelphia 3, Penn.:* Rutan & Co., 404 Architects Bldg. • *San Francisco 10, Calif.:* Pacific Metals Co., Ltd., 3100 19th St. • *Seattle 4, Wash.:* Eagle Metals Co., 3628 E. Marginal Way • *Toronto 5, Ontario, Canada:* Alloy Metal Sales, Ltd., 881 Bay St. • **Bundyweld nickel and Monel tubing is sold by International Nickel Company distributors in all principal cities.**

PRIMARY APPLICATION	TRADE NAME & TYPE	ANALYSIS (%)	SUGGESTED TEMPERATURE RANGES (°F)						Quenching Medium. ★ % Machinability Annealed. Movement in Hardening.
			Forging	Finish Forging	Annealing	Preheating	Hardening	Tempering	
DELAWARE TOOL STEEL CORP., 3300 Market St., Wilmington 99, Del.									**Listing No. 15**
Punching and Shearing, also Shock Resisting (Repeated Impact)	DELSTEEL ALLOY Water, Oil Hardening	C .50, Mn .35, Mo .55, V .25, Si .85	1900	1400	1450	....	1520–1600	350–600	Water, Oil Mach. 100 Movement B
DETROIT GRAY IRON FOUNDRY CO., 282 Iron St., Detroit 7, Mich.									**Listing No. 16**
Cold Work Dies (Blanking, Forming)	CASTALOY Air Hardening	C 1.40-1.60, Mn .45-.65, Cr 13.00-14.00, Mo .80-.90, V .45, Co .60-.70, Si .35-.50, Ni .45 Max.	....	....	1650 (Furnace Cool)	....	1850‡	...	
Cold Work Dies (Coining, Trimming)	KROKOLOY Air Hardening	C 1.40-1.60, Mn .45-.65, Cr 13.00-14.00, Mo .80-.90, Co 3.00-3.50, Si .35-.50, Ni .45 Max.	....	....	1650 (Furnace Cool)	....	1850‡	...	
Cold Work Dies (Coining, Trimming)	MARTIN Air Hardening	C 1.40-1.60, Mn .45-.65, Cr 13.00-14.00, Mo 1.00-1.10, Co 1.10-1.50, Si .35-.50, Ni .45 Max.	....	....	1650 (Furnace Cool)	....	1850‡	...	
		‡ One hour per inch thickness and air cool.							
DETROIT STEEL CORP., CRAINE-SCHRAGE STEEL DIVISION, 8701 Epworth Blvd., Detroit 4, Mich.									**Listing No. 17**
Cold Work Dies (Blanking)	CRASCO GREEN LABEL Water Hardening	C 1.00, Mn .15-.35, Si .15-.35	1900	1650	1450	....	1425 (Temper to desired hardness)		Water Movement B
Cold Work Dies (Blanking)	CRASCO SPECIAL VANADIUM Water Hardening	C 1.00, Mn .15-.35, V .20, Si .15-.35	1900	1650	1450	....	1425 (Temper to desired hardness)		Water Movement B
Cold Work Dies (Cold Forming)	CRASCO BLACK LABEL Air Hardening	C 1.50, Mn .35, Cr 12.00, Mo .80, V .20, Si .20-.35	2000	1700	1650	1450	1800 (Temper to desired hardness)		Air Movement A
Cold Work Dies (Cold Forming)	CRASCO RED LABEL Oil Hardening	C .90, Mn 1.15, Cr .50, W .50, Si .20-.35	1900	1600	1450	1200	1475 (Temper to desired hardness)		Oil Movement A
Cutting Tools	CRASCO HIGH SPEED High Speed	C .65-.75, Mn .35, Cr 3.90-4.40, W 17.50-18.50, V 1.00-1.25, Si .20-.40	2100	1700	1650	1500	2350	1050	Oil Movement A
Gages	CRASCO RED LABEL ....(Listed Above)								
Plastic Molding Dies (Hubs)	(See CRASCO BLACK LABEL, CRASCO RED LABEL, Listed Above)								
Plastic Molding Dies (Machine Cut Cavity Dies)	CRASCO YELLOW LABEL Oil Hardening	C .50, Mn .80, Cr 1.00, V .20	2000	1650	1450	1200	1600 (Temper to desired hardness)		Oil Movement A
Plastic Molding Dies (Machine Cut Cavity Dies)	CRASCO RED LABEL ....(Listed Above)								
Punching and Shearing	CRASCO Special Vanadium..(Listed Above)								
Shock Resisting (Intermittent Impact)	....CRASCO YELLOW Label ..(Listed Above)								
Shock Resisting (Repeated Impact)	CRASCO ALLOY CHISEL Oil Hardening	C .44-.50, Mn .35-.45, Cr .70-.90, W 1.00-1.20, V .15-.25	1900	1650	1450	1250	1650 (Temper to desired hardness)		Oil Movement A
THE DIEHL STEEL CO., 236 Broadway, Cincinnati 2, O.									**Listing No. 18**
Cold Work Dies (Blanking, Cold Forming)	GRADE "A" Water Hardening	C .95, Mn .30, Si .20	1700	1500	1400	....	1420–1470	300–400	Water Movement —A
Cold Work Dies (Blanking, Cold Forming)	UTEX Oil Hardening	C .95, Mn 1.00, Cr .50, W .60, V .25, Si .25	1700	1550	1460	....	1470–1490	350–450	Oil
Cold Work Dies (Cold Forming)	HICRO Oil Hardening	C 1.55, Mn .25, Cr 12.00, Mo .80, V .35, Si .35	2000	1800	1650	....	1750–1850 1800–1900	400–1000 ...	Oil, Air
Cold Work Dies (Punches, Small Tools)	VERI BEST DRILL ROD Oil Hardening	C .95, Mn 1.05, Cr .55, W .65, V .15, Si .35	....	....	1440–1475	....	1440–1490	320–460	Oil
Cutting Tools	BLUE STREAK MOLY Oil Hardening, High Speed	C .80, Cr 4.00, W 5.75, Mo 4.50, V 1.60	2050	1900	1550–1600	1450–1550	2225–2275	1000	Oil
Cutting Tools	BLUE STREAK 18-4-1 Oil Hardening	C .72, Cr 4.00, W 18.00, V 1.00	2150	1800	1650	1550	2300–2375	1000–1100	Oil
Hot Work Dies	A. M. D. Air Hardening	C .34, Mn .40, Cr 4.75, W 1.10, Mo 1.45	1950	1800	1550	....	1825	1050	Air
Punching, Shearing	(See GRADE "A", UTEX, Listed Above)								
Ring Cold Work Dies	HOLLOBAR Oil Hardening	C 1.05, Mn .38, Cr 1.46, Si .28	1700	1600	1540	....	1520	450	Oil

★ Last column indicates suggested Quenching Medium; Machinability Annealed using base 100 for carbon and low alloy steels; and Movement in Hardening by "A" for slight, "B" for intermediate, "C" for considerable movement—"+" denotes expansion, "—" denotes contraction.

cast iron miter and spur gear machined in 3.68 minutes on P.&J.1

4DE

DETAILS OF JOB

PART—Miter and Spur Gear

MATERIAL—Cast Iron

Method and Operation—Presenting open end to spindle, grip under rim with 3 chuck jaws.

Machine as follows:

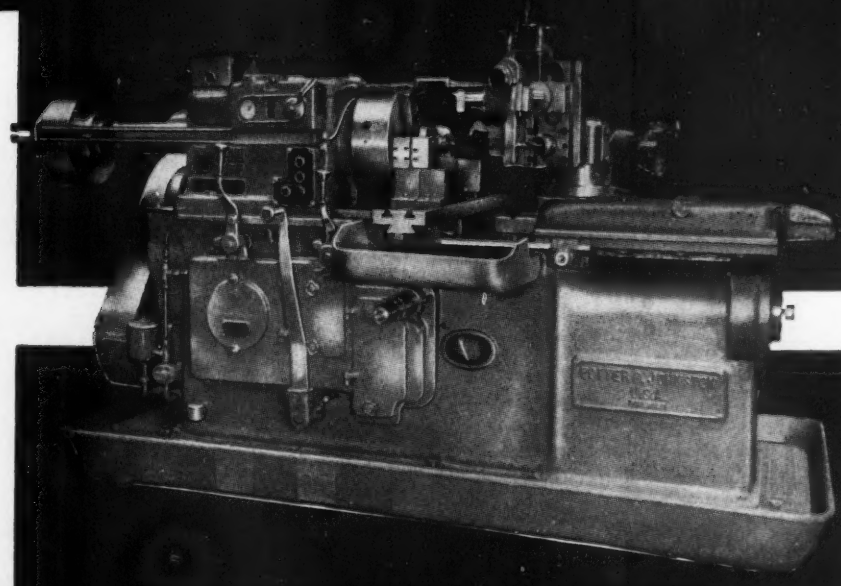
1st T.F.—Rough turn O.D. of hub; drill hole part way; broadface end of hub; form bevel at end of hub.

2nd T.F.—Drill hole through; rough turn O.D.; rough straddle face rim; form groove on hub.

3rd T.F.—Finish bore hole; finish turn O.D. of hub; finish turn O.D.; finish straddle face rim; finish form bevel at end of hub; chamfer hole.

4th T.F.—Ream 1.000″ dia. hole.

5th T.F.—Blank.



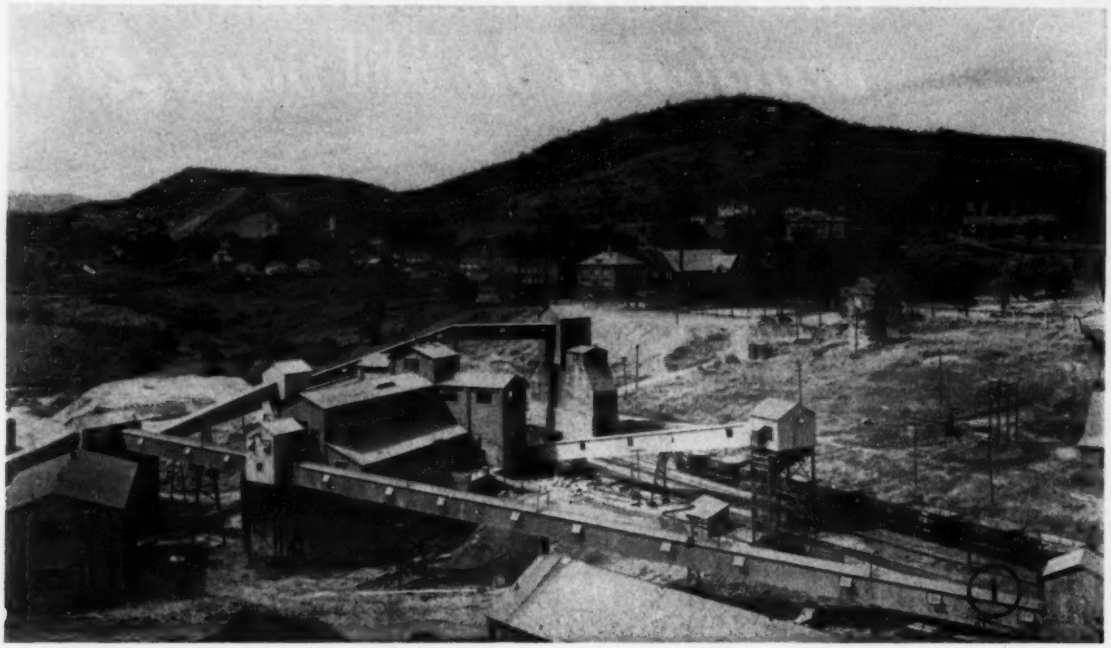
POTTER & JOHNSTON CO.
PAWTUCKET, RHODE ISLAND
Subsidiary of
PRATT & WHITNEY
Division Niles-Bement-Pond Company

...C 1.05, Mn .38, Cr 1.46, Si .28 ..... 1700 1600 1540 .... 1520 450 Oil
...HOLLOBAR
Oil Hardening

★ Last column indicates suggested Quenching Medium; Machinability Annealed using base 100 for carbon and low alloy steels; and Movement in Hardening by "A" for slight, "B" for intermediate, "C" for considerable movement—"+" denotes expansion, "—" denotes contraction.

...ing Cold WORK Dies

EL



Adirondack Iron

. . . its economic and potential

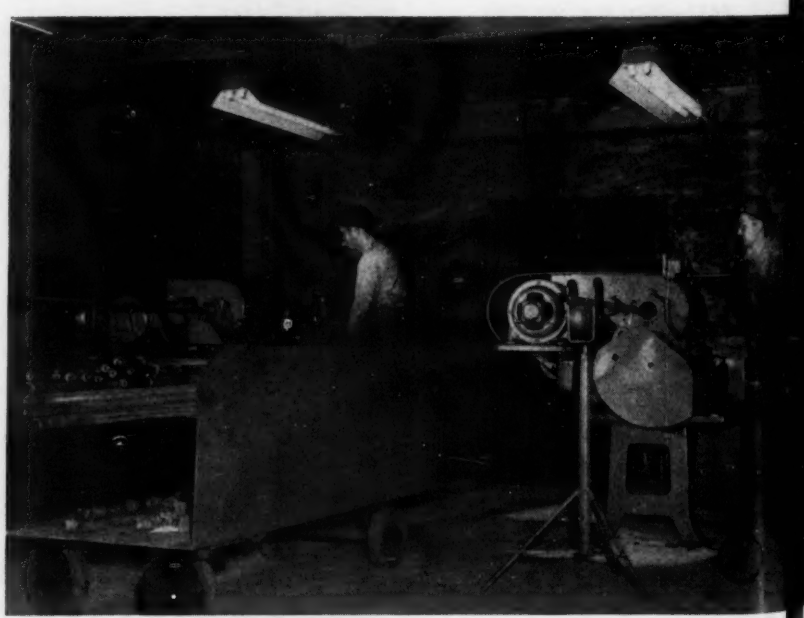
New York state iron ore mines, among the oldest in the country, are now being looked to as a raw material reserve for the steel industry. These ores are reported to lend themselves admirably to concentration and sintering to produce excellent open hearth charge ore and blast furnace sinter

Fig. 1—General view of Republic Steel Corp. plant at Mineville, N. Y. showing hoist house, crushing and cobbing units, schools, club building office and hospital

Fig. 2—Typical view of an underground stope showing scraping operators at work at a Port Henry, N. Y. district mine

Fig. 3—Drills are sharpened in a specially built room 300 feet below the surface in Chateaugay mine at Lyon Mountain, N. Y.

Fig. 4—Battery of rod mills shown in the concentrating plant at Mineville, N. Y.



Iron Ore Mining

potential value to the steel industry

By D. B. GILLIES
Mining Consultant
Republic Steel Corp.
Cleveland

DURING 1938 Republic Steel Corp. announced that it had leased the ore mines and other property of Witherbee Sherman Corp. at Port Henry, N. Y. The announcement brought forth an interesting reaction. Two questions were asked repeatedly: Is the iron product high grade and is there a substantial reserve?

The answer to both questions was and is a decided and emphatic "Yes."

Though iron ore is found in virtually every state in the union, it is mined on a commercial basis in less than a dozen. Among these are: Minnesota, Michigan, Wisconsin, New York, Alabama, New Jersey, Pennsylvania, Utah, and perhaps a few others producing small tonnages. Large deposits also exist in other states, but they remain almost entirely untouched, partly because we have been spoiled by the highgrade seemingly inexhaustible fields in the Lake Superior region, and partly because these unmined deposits are usually too far removed from markets and manufacturing facilities.

Odd as it may seem, ore mines in New York state are among the oldest in the country, but for many years were virtually forgotten by the steel industry. The first mines were opened almost a century and a half ago. Benedict Arnold in his regimental book tells of sending men to Port Henry to dig iron ore in 1775. Tradition says that the cannon at Port Ticonderoga were made from this ore. For many decades thereafter the Adirondack region supplied a large part of the iron ore used in our expanding country. Always, though, transportation difficulties were present; there was the problem of bringing ore from inaccessible mines in mountainous country to the market.

At the time, population and industry were moving westward. In 1844 ore was discovered in northern Michigan and the first shipment of approximately five tons moved southward six years later. Small ore movements became larger as more mills were built west of the Alleghenies. In 1890 the Merritt brothers discovered the Mesabi range and with their discovery came the birth of the modern steel industry. It is little wonder, therefore, that the Adirondack workings should, with only two or three exceptions, sink from public notice. Accompanying table shows relative importance of iron ore mining areas in the United States.

In 1938, therefore, when we announced our entrance into the Adirondacks, the region was little known or appreciated. Now why did our organization lease the Witherbee-Sherman property and one year later the Lyon Mountain mine of the Chateaugay Ore & Iron Co.?

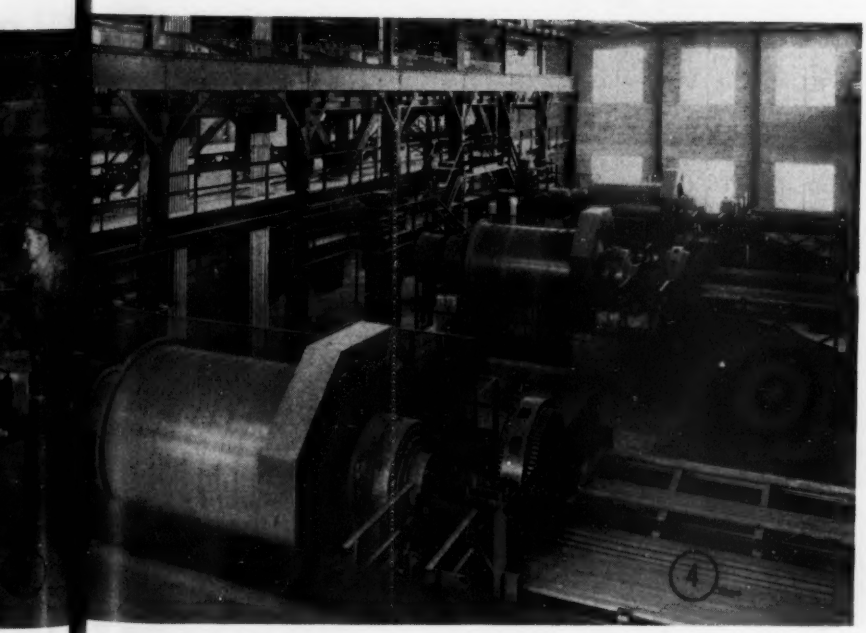
Shortly after the middle of the 1930's, studies confirmed the general realization that deposits of high-grade ore in the Lake Superior district were not unlimited and might well be economically exhausted sometime in the not too distant future. In addition to threatened depletion of Lake Superior's ore reserves, short shipping seasons and vessel shortages are ever present uncertainties. Furthermore, for the past 40 years no new discoveries of importance have been made in the northern ore fields or, for that matter, in the United States as a whole.

Taking all of these factors into consideration, our management believed it wise to seek another source of high-quality supply, with sufficient reserves to ensure long life together with assured all-year shipments by rail or rail and water. It so happens that I had long been familiar with the Adirondacks and their possibilities, and no extended argument was necessary to convince my associates that a careful study should be made. As a result, in 1938 Witherbee Sherman was leased for 25 years with a renewal clause covering an additional quarter of a century, and in 1939 we also acquired by lease the property of Chateaugay Ore & Iron Co. at Lyon Mountain for a like period. This property was purchased in 1943. Our present experience has confirmed our opinion of some years ago that the Adirondack region can supply a substantial proportion of the high-quality ore required by our steel mills.

Now to take up the two questions earlier mentioned. The first was: Is the iron product high grade?

Iron content of Adirondack ores varies from the almost pure magnetite found in some of the Mineville openings down to the 22 or 25 per cent iron content which is currently the lower limit for profitable concentration. As Adirondack ore reserves are figured today, average ore of the region would probably fall not much above 35 per cent metallic iron. This means that typical ore is about half magnetite and half gangue rock by weight.

Richest ore from our underground mines in the Adirondack region is that from the Old Bed deposit at Port Henry. Approximately 20 per cent of the Old Bed production, or 140,000 long tons per year, can be separated from the total mine output into lump ore that will contain 61 per cent iron. This is of equal quality with the rap-



it *will* save your money

it *may* save a product

it *has* saved a life

NO other alloy satisfies the exacting demands of industry in so wide a range of applications as Circle Ⓛ 22, the time-tested "18 and 8". It is saving money every hour of every day by lengthening equipment life, cutting repairs and plant "down-time". It guards product quality against contamination by corrosion. In handling dangerous gases and liquors, men's lives depend on the integrity of castings made from this "18 and 8" alloy.

A set of data sheets describing Circle Ⓛ 22, 22 M and 22 XM, Lebanon's "18 and 8" alloys, is yours for the asking.

LEBANON CIRCLE Ⓛ 22

An "18-8" Alloy

NOMINAL ANALYSIS

Carbon Max.	0.07
Silicon	1.25
Manganese	0.75
Chromium	19.50
Nickel	9.00

NOMINAL PHYSICAL PROPERTIES

Tensile Strength	75,000
Yield Point	36,000
Elongation in 2"—%	50
Brinell Hardness	135

LEBANON STEEL FOUNDRY • LEBANON, PA

"In The Lebanon Valley"

ORIGINAL AMERICAN LICENSEE GEORGE FISCHER (SWISS CHAMOTTE) METHOD

LEBANON *ALLOY AND STEEL* Castings

CIRCLE L

idly decreasing lump ore of the Lake Superior region and, although containing some excess phosphorus, has been found to be an excellent open-hearth feed ore. Operating cost figures indicate that this material can be delivered to steel plants in the Pittsburgh or Valley region at a cost that is competitive.

These ores lend themselves admirably to concentration and sintering to produce excellent open-hearth charge ore and blast furnace sinter, and so establish the economic value of the ores from this entire region. They are ground to approximately 10 mesh and concentrated by a relatively simple magnetic concentration operation, so that when the concentrate is sintered the product averages 68.5 per cent iron. We have been able to secure an iron concentrate as high as 71.9 compared to the theoretical composition of pure magnetite of 72.4 per cent iron, but this grade has not been found to be suitable for the manufacture of good sinter.

IRON ORE MINED IN THE U. S.

District	Per Cent of Total 1918-1928	1946
Lake Superior	84.5	83.9
Birmingham, Chattanooga	10.2	8.4
Adirondack, N. Y.	0.6	3.1
Northern New Jersey and Southeastern New York	0.8	0.6
Other Districts	3.9	4.0

The average analysis for Mesabi ore (1943-1948 inc.) is as follows:

51.59	Iron (natural)
58.27	Iron (dry)
0.060	Phosphorus
8.37	Silicon
0.66	Manganese
11.46	Moisture

Adirondack sinter is highly desirable for use in the open hearth as charge ore. Many tests have been made in our open hearths which demonstrate the superiority of magnetite sinter over Lake Superior soft ores. High-iron charges (55 per cent and over) are substantially aided by use of this material, which results in an increased tonnage of steel ingots per furnace hour, decreased fuel consumption, and added safety to the open-hearth workmen.

Magnetic properties of this sinter lend themselves to easy handling by magnet, permitting rapid loading of charging boxes. Its moisture content is extremely small so that freezing difficulties in winter are reduced to an absolute minimum.

For the past 10 years we have been using a large amount of sinter in our blast furnaces. Increasing percentage of sinter in the blast-furnace burden to as much as 40 to 45 per cent of the metallic charge raises

production from 10 to 19 per cent, coke consumption is thereby decreased approximately 15 per cent, flux consumption lowered approximately 20 per cent, and flue-dust production cut down as much as 50 per cent. Use of Adirondack magnetite sinter in place of Lake Superior soft ores therefore results in many blast-furnace savings.

The next question regarded the ore reserves of the Adirondack region. If one wishes to be accurate, the answer to this question is that no one knows exactly. Approximately 12,000 square miles in northern New York state is iron-bearing territory, an area that stretches 100 miles from east to west and roughly 125 miles from north to south. Many estimates have been made as to reserves in the district. In 1935, for instance, they were placed at 600 million tons of magnetite ore and two billion tons of titaniferous ore. No estimate can be more than a guess, however, due to the geological formation of the territory and to the fact that modern scientific exploration has been made in only a portion of the region. Exploration on our own properties has clearly proved that ample ore exists, of a type highly desirable to carry us through the period of our leases.

As an example of the productiveness of this region, the Witherbee-Sherman properties may be regarded as typical. They have produced, since operation started in 1870, approximately 31 million long tons of ore, despite the fact that the mines were closed for many of the intervening years. That they are capable of a substantial expansion is shown by the fact that in 1935 the Adirondack district produced less than 300,000 long tons, whereas seven years later output was in excess of 3,000,000 long tons of crude ore. This ore was chiefly magnetite, produced in underground operations of our properties in this section. Operating at full capacity our expanded properties should have a capacity to produce approximately 2,250,000 long tons of sinter averaging 68.5 per cent iron, 2 per cent silica, and an extremely low percentage of phosphorus.

The fact that other steel companies are operating in the Adirondacks would indicate that they, too, believe this to be a valuable reserve for our steel industry. In our estimation the Adirondack region is of utmost importance to the well-being not not only of the steel industry, but of the nation as a whole.

In the years to come the Adirondacks should constitute an even more important source of iron ore than it is today.

—o—

Ideally suited for molding large thermo-setting plastic parts such as radio cabinets, instrument housings and other similar large-area parts, a compression semiautomatic molding press has been built by Hydraulic Press Mfg. Co., Mt. Gilead, O. The maximum mold size is 42 x 36 inches.

Handling of Light Metal Parts

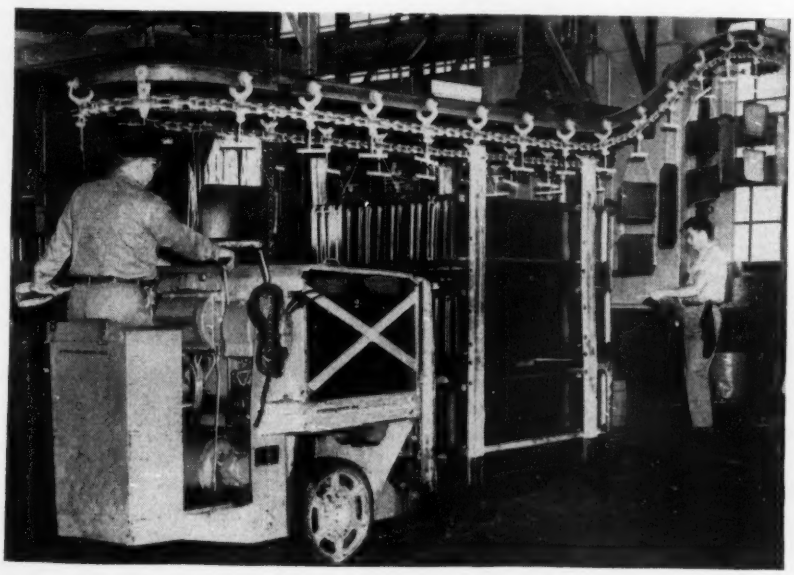
. . . expedited with lift trucks and special skids

SPECIAL type skids and storage battery powered trucks have been found to be the solution for moving materials which involve the problem of bulk instead of weight. Fred Medart Division of Medart Co., St. Louis, uses this method of moving metal doors, shelves, panels, etc. from punching and stamping department, through paint department, thence to assembly as steel lockers, kitchen tables and utility cabinets and finally to packaging and shipping. Quantities of 75 or more pieces are handled at one time.

Same battery powered trucks are used to supply raw materials in the form of sheet metal and plates to the press department. After these are deposited adjacent to operator's work area, truck picks up and moves skid loads of formed parts to other operations.

As shown in the accompanying illustration, platform truck brings a load of stamped parts to chain conveyor line for final processing. Parts move on these conveyors through various operations in paint department and along packaging line to storage area in shipping department.

An additional job performed with a battery powered truck is the replacement of heavy dies used in forming operations. A veteran high lift platform truck with 30 years of operation is used to get the dies out of storage racks and position them on beds of machines. In the opinion of the company, this rebuilt truck saves them many hours in die changing time as well as considerable manual effort.



Stamped steel doors are delivered to chain conveyor line for painting and assembly by means of a battery powered low lift truck. Photo courtesy Electric Industrial Truck Association

INDUSTRIAL INSTRUMENT APPLICATIONS

Featured at National Instrument Conference And Exhibit

FIFTEEN technical sessions and an instrument fair, showing devices made by the 150 exhibitors for measurement, inspection, testing and control, are expected to attract representatives from practically all industries to the National Instrument Conference and Exhibit, at Philadelphia's convention hall, Sept. 13-17. The Instrument Society of America, sponsor of the show, is joined this year by the American Society of Electrical Engineers, American Institute of Physics and American Society of Mechanical Engineers.

The extensive field of instruments and instrumentation will be thoroughly covered by technical papers ranging from cathode ray oscillograph developments for laboratory and production use, to instruments in crime detection. Sessions on temperature and pressure elements, automatic controls, control valves, scientific instruments, process control, electronics, control instrumentation, will be of interest to the metalworking industry.

A special program arranged by the educational committee of the ISA, will offer instrument men, and apprentices, inspectors and shop men, meter men and others the opportunity to brush up on some of the subjects directly associated with instrumentation. In conjunction with the conference and exhibit, the following short courses will be offered at convention hall under the direction of Dr. E. D. Wilson, head of the chemical engineering department, Worcester Polytechnical Institute, and chairman, ISA education committee: Electrical Measurements—Fundamental electrical indicating instrument mechanisms, instrument accessories and auxiliary devices, recorders and integrating devices, industrial test equipment; Industrial Instruments—Pressure and thermal systems, flow and liquid level, ABC of automatic control, electrical temperature measurements. Courses are open to members of all co-operating societies without charge. To others the registration fee is $2.

Movies showing instruments and their applications are scheduled for the afternoons of Tuesday, Wednesday and Thursday, Sept. 14, 15 and 16, in the convention hall ballroom. Anologs used in the study of industrial controls will be displayed and demonstrated during the conference. A round table conference on instrument education is on the program for Tuesday, Sept. 14.

A round table discussion on standardization, sponsored by the ISA recommended practices committee, will be adressed by G. P. Clay, technical department, general instrument section, Imperial Chemical Industries Ltd., London, England; the speaker is also chairman of the instrument subcommittee of the British Standards Institution.

Annual business meeting of the Instrument Society of America is scheduled for Wednesday, Sept. 15, in the ballroom, convention hall. The industrial instruments and regulators division of American Society of Mechanical Engineers, in co-operation with the Philadelphia section, ASME, has arranged a luncheon for Tuesday, Sept. 14, at which ASME president, E. G. Bailey, will speak. The banquet will be held on Wednesday evening, Sept. 15, ballroom of the Benjamin Franklin hotel. Speaker will be Frank Totton, vice president, Chase National Bank, New York.

Technical Program

MONDAY, SEPT. 13—10 a.m.

I.S.A. Session on Ordnance Instruments. Room 200. Technical chairman, to be announced.

"A Comparison of Small and Medium Power Servomotors," by Robert S. Edwards, Sperry Gyroscope Co., Great Neck, L. I.

"Photographic Instrumentation Used in the Development of the 'Bat' Missile," by H. K. Skramstad, Guided Missiles Section, Ordnance Development Laboratory, Washington.

"Temperature and Pressure Measurements in Rockets," by R. J. Havens, Naval Research Laboratory, Washington.

MONDAY, SEPT. 13—2:30 p.m.

A.S.M.E. Session on Temperature and Pressure Elements. Room 200. Technical Chairman, I. M. Stein, Leeds & Northrup Co., Philadelphia. Recorder, G. H. Lee, U. S. Naval Academy, Annapolis, Md.

"Response Characteristics of Resistance Thermometers," by A. J. Hornfeck, Bailey Meter Co., Cleveland.

"Bourdon Tubes in 5000 psi Pressure Transmitters," by O. C. Brewster, Consultant, Litchfield, Conn.

MONDAY, SEPT. 13—8 p.m.

I.S.A. Session on Automatic Control. Ballroom.

"Demonstration of Automatic Control Principles," by Gerald F. Akins, assisted by John H. Kowalski, Eastman Kodak Co., Rochester, N. Y.

TUESDAY, SEPT. 14—10 a.m.

I.S.A. Session on Control Valves. Room 200. Technical chairman, Paul Elfers, Fisher Governor Co., Marshalltown, Iowa.

"Valve Characteristics and Automatic Control," by J. G. Ziegler and N. B. Nichols, Taylor Instrument Cos., Rochester, N. Y.

"Control Valve Body Design," by D. P. Eckman, Cornell University, Ithaca, N. Y., and R. B. Werey, Conoflow Corp., Philadelphia.

"The Liquid Flow Characteristics of a Pipe Line and a Control Valve," by Otto Kneisel, Hammel-Dahl Co., Providence, R. I.

TUESDAY, SEPT. 14—10 a.m.

A.I.P. Session on Scientific Instruments. Room 300. Chairman, Gaylord P. Harnwell, University of Pennsylvania, Philadelphia.

"Electron Microscopy," by James Hillier, Radio Corp. of America, Princeton, N. J.

"The Measurement of the Particle Size of Sub-Sieve Powders," by R. E. Payne, Sharpless Corp., Philadelphia.

"Infrared Instrumentation," by Van Zandt Williams, American Cyanamid Co., Stamford, Conn.

TUESDAY, SEPT. 14—2:30 p.m.

A.S.M.E. Session on Process Control. Room 200. Chairman, R. L. Goetzenberger, Brown Instrument Co., Washington, D. C. Recorder, R. W. Hunting, Philadelphia Electric Co., Philadelphia.

"The Control Valve in Operation," by W. H. Kidd, formerly Foxboro Co., and G. A. Philbrick.

Additional papers to be announced later.

TUESDAY, SEPT. 14—8 p.m.

I.S.A. Session on Electronics. Ballroom.

"Looking into the Future of Electronics," Gordon Volkenant, Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

WEDNESDAY, SEPT. 15—10 a.m.

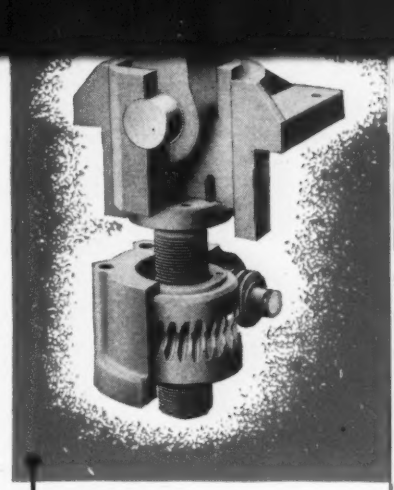
I.S.A. Session on Cascade Controls. Room 300. Technical chairman, Garner C. Parr, Ash Engineering Co., Philadelphia.

"The Use of Interconnected Control Instrumentation for Offsetting Unfavorable System Characteristics," by J. A. Pellettere, Gulf Oil Corp., Pittsburgh.

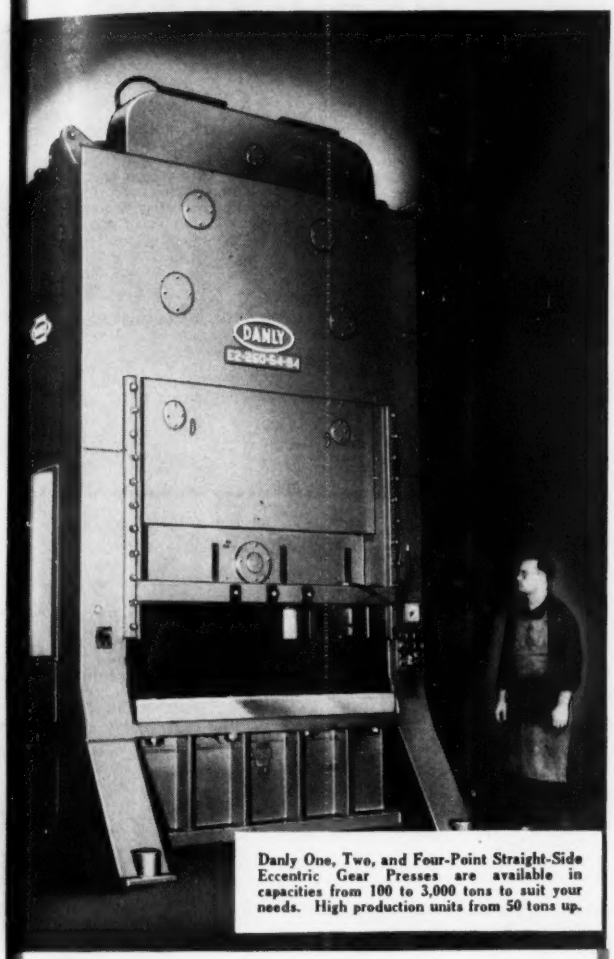
"Experimental Application of Combustion Controls to a Process Heater," by W. E. Boyle, Shell Oil Co., Inc., Wood River, Ill., and P. R. Hoyt, Shell Development Co., San Francisco.

"The ABC's of Multi-Element Control,"

How the Pitman Wrist-Pin Design Promotes Longer Press Life on DANLY Presses



View showing pitman wrist-pin and replaceable bronze bushing, connection and slide adjustment. Long, accurate guide eliminates bending stresses in adjusting screw.



Danly One, Two, and Four-Point Straight-Side Eccentric Gear Presses are available in capacities from 100 to 3,000 tons to suit your needs. High production units from 50 tons up.

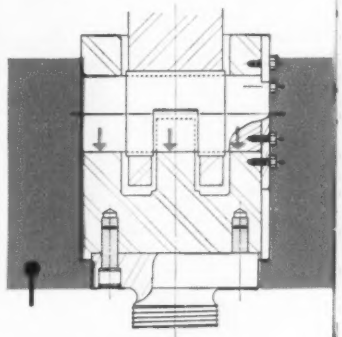
SIMPLIFIED CONSTRUCTION PERMITS ACCURATE MACHINING OF PITMAN AND SLIDE PARTS—ASSURES LONGER PRESS LIFE, LESS DOWN-TIME

Here is more proof of the care taken in designing Danly Presses to assure longer press life, less down-time.

The application of the pitman wrist-pin and the construction of the slide adjusting mechanism permits accurate machining and precision fitting of the component parts.

As illustrated, three-point support for the power stroke eliminates possibility of wrist-pin shearing, and minimizes deflection. The wrist-pin is locked in the guide of the slide adjusting unit to prevent oscillation. Wear on the pin and pitman is minimized by use of a *hardened and ground* pin, and aluminum-iron alloy bronze bushings with special properties for toughness and resistance to wear. The moving parts of the connecting assembly are lubricated by the main built-in circulating filtered oiling system.

This careful engineering of Danly Presses, the result of 25 years of association with the metal stamping industry, promotes longer press life, longer die life, higher production efficiency, and lower net costs.



Wrist-pin hardened and ground to precision tolerances is accurately fitted and locked in machined guide. Replaceable wrist-pin bushing of tough wear-resistant bronze alloy reduces maintenance. Three-point bearing support on power stroke prevents pin shearing, minimizes deflection.

Check These DANLY *Press Features*

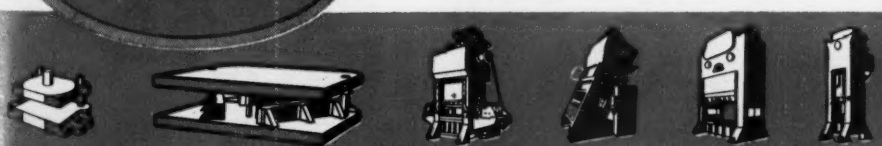
- ☐ New Exclusive Ventilated Air Friction Clutch—gives long trouble-free service—cuts maintenance costs.
- ☐ Built-in Automatic Filtered Oiling System lubricates all bearings — including flywheel bearings.
- ☐ Rigid Box-Type Frame Construction of Stress-Relieved Welded Steel Plate.
- ☐ Fully Enclosed Crown Construction.
- ☐ Extra Long Bronze Lined Slide Ways and Precision Machined Gibs.
- ☐ Safe Automatic Electrical Controls with Reverse and Anti-Repeat Feature.

write for *Free* bulletin

Write today for more facts about Danly Presses. Get details on other important cost-saving features, especially engineered to help you reduce down-time and increase production. Ask for specific recommendations or engineering assistance.

DANLY

DANLY MACHINE SPECIALTIES, INC.
2100 SOUTH 52ND AVENUE, CHICAGO 50, ILLINOIS



25 YEARS OF DEPENDABLE SERVICE TO THE STAMPING INDUSTRY

PRECISION DIE SETS...STANDARD AND SPECIAL ● MECHANICAL PRESSES AND PRESS EQUIPMENT

by C. H. Barnard, Bailey Meter Co., Cleveland.

WEDNESDAY, SEPT. 15—10 a.m.

A.I.P. Session on Scientific Instruments. Room 300. Chairman, George R. Harrison, Massachusetts Institute of Technology, Cambridge, Mass.

"The Physical Principles of Vacuum Measurements and Production," by C. H. Bachman, Syracuse University, Syracuse, N. Y.

"Acoustics Instrumentation," by Richard H. Bolt, Massachusetts Institute of Technology, Cambridge, Mass., and Richard K. Cook, National Bureau of Standards, Washington, D. C.

"The Tools of the Physics Teacher," by Richard M. Sutton, Haverford College, Haverford, Pa.

THURSDAY, SEPT. 16—10 a.m.

I.S.A. Session on Control Instrumentation. Room 300. Technical chairman, A. Novak, Monsanto Chemical Co., Boston.

"Supervisory Control Systems," by Louis Gess and R. M. Hutchinson, Brown Instrument Co., Philadelphia.

"Pneumatic Transmissions," by V. V. Tivy, Foxboro Co., Foxboro, Mass.

"Instrumentation—By and With Controlled Volume Pumps," by Robert T. Sheen, Milton Roy Co., Philadelphia.

THURSDAY, SEPT. 16—10 a.m.

A.I.P. Session on Scientific Instruments. Room 300. Chairman, Elmer Hutchison, Case Institute of Technology, Cleveland.

"Radio Spectroscopy," by Charles H. Townes, Columbia University, New York.

"Gas Analysis by the Mass Spectrometer," by Alfred O. C. Nier, University of Minnesota, Minneapolis.

"Radioactive Tracer Techniques and Measurements," by L. F. Curtiss, National Bureau of Standards, Washington.

THURSDAY, SEPT. 16—2:30 p.m.

A.I.E.E. Session on Electronic Instruments. Room 200. Chairman, R. Feldt, Allen B. DuMont Laboratories Inc., Passaic, N. J.

"Fail-Safe Operation of Electronic Circuits," by G. D. Hanchett, R.C.A. Mfg. Co., Camden, N. J.

"Cathode Ray Oscillograph Developments for Laboratory and Production Use," by C. Berkley, Allen B. DuMont Labs., Inc., Passaic, N. J.

"Oil Film Thickness Indicator for Journal Bearings," by Mr. M. L. Greenough, National Bureau of Standards, Washington.

THURSDAY, SEPT. 16—8 p.m.

I.S.A. Session on Instruments in Crime Detection. Ballroom.

"Science in Crime Detection," by L. V. Boardman, special agent in charge, Philadelphia office, Federal Bureau of Investigation, Philadelphia.

FRIDAY, SEPT. 17—10 a.m.

I.S.A. General Instrument Session. Room 200. Technical chairman, E. D. Wilson, Worcester Polytechnic Institute, Worcester, Mass.

"Flow Measurement of Gases and Liquids through Primary Elements in Pipe Sizes of less than Two Inches," by Henry W. Stoll, Taylor Instrument Cos., Rochester, N. Y.

"Instrumenteering—Trinket or Tool," by J. Johnston, Jr., E. I. du Pont de Nemours & Co., Wilmington, Del.

"The Development of Instrument Curricula," by M. B. Hall, Foxboro Co., Foxboro, Mass.

FRIDAY, SEPT. 17—2:30 p.m.

A.I.E.E. Session on Electronic Instruments. Room 200. Chairman, W. R. Clark, Leeds & Northrup Co., Philadelphia.

"Resume of A.I.E.E. Conference on Electron Tubes for Instrumentation and Industrial Use Held in Philadelphia March 29 and 30," by W. R. Clark, chairman A.I.E.E. Joint Subcommittee on Electronic Instruments.

"A Study of Slide Wire Contact Resistances," by W. E. Belcher, Jr., Brown Instrument Co., Philadelphia.

"Development of Self Balancing Recorders," by A. J. Williams Jr., Leeds & Northrup Co., Philadelphia.

"Salinity-Temperature-Depth Recorder," by A. W. Jacobson, Bristol Co., Waterbury, Conn.

Exhibitors at the Conference

Exhibit hours as follows: Monday 12 noon to 10 p.m.; Tuesday and Thursday 2 p.m. to 10 p.m.; Wednesday and Friday 10 a.m. to 6 p.m.

The 200 exhibit booths have been reserved by 150 exhibitors. Following is the list of exhibitors:

Name	Booth No.
Accuracy Scientific Co., Philadelphia	411
Aeromarine Instrument Co., New York	516
Aeroquip Corporation, Jackson, Mich.	503
Aircraft Marine Products Inc., Harrisburg, Pa.	232
American Car & Fdry., Valve Div., New York	209
American Institute of Physics, New York	149
American Instrument Co., Silver Springs, Md.	540
American Meter Co., Philadelphia	234, 236, 238
American Society of Mechanical Engineers, New York	529
Askania Regulator Co., Chicago	427, 429
Associated Research Inc., Chicago	210
Autoclave Engrs. Inc., Titusville, Pa.	151
Automatic Temperature Control Co., Philadelphia	144, 146, 148
Bacharach Industrial Instrument Co., Pittsburgh	510
Bailey Meter Co., Cleveland	426, 428
Baird Associates Inc., Cambridge, Mass.	506, 508
Ballantine Labs. Inc., Boonton, New Jersey	410
H. Belfield Co., Philadelphia	436
James G. Biddle Co., Philadelphia	214, 216
Branson Instruments Inc., Danbury, Conn.	518
Bristol Co., Waterbury, Conn.	218, 220
Ralph N. Brodie Co. Inc., New York	137
Brooke Engineering Co. Inc., Philadelphia	404
Brookfield Engineering Labs. Inc., Boston	111
Brooks Rotameter Co., Lansdale, Pa.	142
Brown Instrument Co., Philadelphia	435, 437, 439
Brush Development Co., Cleveland	505
Buffalo Meter Co., Buffalo	215
Builders Providence Inc., Providence, R. I.	543
Burgess Battery Co., Freeport, Ill.	229
Century Geophysical Corp., Tulsa, Okla.	133
Clapp Instrument Co., Webster, Mass.	542
C. P. Clare & Co., Chicago	102
Climax Engrg. Co., Controls Div., Tulsa, Okla.	302
Cole Instrument Co., Los Angeles	532
Conoflow Corp., Philadelphia	249
Consolidated Engrg. Corp., Pasadena, Calif.	226
Continental Equipment Corp., Coraopolis, Pa.	217
Cook Electric Co., Greenwich, Conn.	241
Cramer Co. Inc., Centerbrook, Conn.	403
Davis Emergency Equipment Co., Newark, N. J.	304
Davison Chemical Corp., Baltimore	441
Dehydraire Corp., College Point, N. Y.	247
Distillation Products Inc., Rochester, N. Y.	527
Eagle Signal Corp., Moline, Ill.	530
Thomas A. Edison Co. Inc., West Orange, N. J.	517
Electric Tachometer Co., Philadelphia	240
Electro-Tech Equipment Co., New York	114, 116
Energy Control Corp. Philadelphia	438, 440, 442, 443, 444, 445, 446, 447, 448, 449
Englehard Inc., Newark, N. J.	308
Equipoise Controls, Mt. Vernon, N. Y.	520
Esterline Angus Co. Inc., Indianapolis, Ind.	212
Fischer & Porter Co., Hatboro, Pa.	500, 502, 504
Fisher Governor Co., Marshalltown, Iowa	219, 221
Foster Engrg. Co., Newark, N. J.	442
Fredericks Co., Bethayres, Pa.	536, 538
Foxboro Co., Foxboro, Mass.	535, 537, 539
Fulton Sylphon Div., Robertshaw Fulton Controls Co., Knoxville, Tenn.	211, 213
General Electric Co., Schenectady, N. Y.	231, 233, 235
Gotham Instrument Co., New York	128, 130
Gow-Mac Instrument Co., Newark, N. J.	507
Hagan Corp., Pittsburgh	228, 230
Hammel Dahl Co., Providence, R. I.	431, 433
Hays Corporation, Michigan City, Ind.	447, 449
Helicoid Gage Div., American Chain & Cable Co. Inc., Bridgeport, Conn.	448
Helipot Corp., So. Pasadena, Calif.	135
Illinois Testing Labs. Inc., Chicago	202
Industrial Instruments Inc., Jersey City, N. J.	421
Instruments Publishing Co., Pittsburgh	147
International Nickel Co., New York	131
J-B-T Instruments Inc., New Haven, Conn	204
Jerguson Gage & Valve Co., Somerville, Mass.	444
K & K Engrg. Co., Bolton, N. Y.	104
Kieley & Mueller Inc., No. Bergen, N. J.	519, 521
Kelley Koett Mfg. Co., Instrument Div., Covington, Ky.	534
Lawter Chemicals Co., Chicago	430
Leeds & Northrup Co., Philadelphia	246, 248
Leland Instrument Co., Detroit	414
Leslie Co., Lyndhurst, N. J.	127, 129
Linde Air Products Co., New York	526
Liquidometer Co., Long Island City, N. Y.	207
J. E. Lonergan Co., Philadelphia	143
Macbeth Corp., New York	309
Magnetrol Inc., Chicago	445
Manning, Maxwell & Moore Inc., Bridgeport, Conn.	103, 105
Mason-Neilan Reg. Co., Boston	242, 244
McGraw Hill Publishing Co., New York	117
Meriam Instrument Co., Cleveland	314, 316
Milton Roy Co., Philadelphia	112
Miniature Precision Bearings Inc., Keene, N. H.	101
Mine Safety Appliances Co., Pittsburgh	119, 121
Moore Products Co., Philadelphia	106, 108, 110
National Bureau of Standards, Washington	546, 548
National Technical Labs., Pasadena, Calif.	406, 408
Naval Ordnance Lab., Naval Gun Factory, Washington	245
New Hampshire Ball Bearings, Inc., Peterborough, N. H.	544
New York Naval Shipyard, Naval Base Station, Brooklyn, N. Y.	139
Optical Film Engrg. Co., Philadelphia	511
Palmer Thermometers Inc. Cincinnati	446
Penn Industrial Instrument Corp., Philadelphia	438, 440
Perkin-Elmer Corp., Glenbrook, Conn.	545
Permo Inc., Chicago, Ill.	307
Photoswitch Inc., Cambridge, Mass.	227
Permutit Co., New York	547
Physicists Research Co., Ann Arbor, Mich.	113, 115
Philadelphia Thermometer Co., Philadelphia	243
Precision Thermometer & Instrument Co., Philadelphia	303
Precision Tube Co., Philadelphia	407
Production Instrument Co., Chicago	310
Proportioneers Inc., Providence, R. I.	541
R.C.A. Victor, Camden, N. J.	531, 533
Republic Flow Meters Co., Chicago	413, 415
Roller Smith Div., Realty & Industrial Corp., Bethlehem, Pa.	515
Rowe Engineering Corp., Chicago	320, 321
R-S Products Corp., Philadelphia	315, 317
Rubicon Co., Philadelphia	528
Sarco Co. Inc., New York	319
Schutte & Koerting Co., Philadelphia	203, 205
Seely Instrument Co. Inc., Niagara Falls, N. Y.	434
Shallcross Mfg. Co., Collingdale, Pa.	311, 313
Sharples Corp., Philadelphia	509
Sheffler Gross Co., Philadelphia	207, 209, 211, 213, 215
Simplex Valve & Meter Co., Philadelphia	549
Smith Meter Co., New York	141
Sorenson & Co. Inc., Stamford, Conn.	512, 514
South Bend Lathe Works, South Bend	432
Standard Electric Time Co., Springfield, Mass.	312
Herman H. Sticht Co., New York	306
Streeter Amet Co., Chicago	305
Superior Tube Co., Norristown, Pa.	206
C. J. Tagliabue Corp., of N. J., Newark, N. J.	118, 120
Taylor Instrument Cos., Rochester, N. Y.,	416, 418, 420
Telechron Inc., Ashland, Mass.	417
Test Equipment Sales Co. Inc., Philadelphia	107, 109
Thwing Albert Instrument Co., Philadelphia	412
H. O. Trerice Co., Detroit	405
Trimount Instrument Co., Chicago	107
Trinity Equipment Corp., Newark, N. J.	318
Uehling Instrument Co., Paterson, N. J.	409
Wallace & Tiernan Products Inc., Belleville, N. J.	402
Veeder-Root Inc., Hartford, Conn.	126
Weatherhead Co., Cleveland	145
Weston Electrical Inst. Corp., Newark, N. J.	419
Wheelco Instruments Co., Chicago	237, 239
Wing Corporation, Philadelphia	513
Raymond M. Wilmotte, Inc., Washington	208

Mechanized Foundry Operations

Transform Molten Metal to Finished Castings in 1¼ Hours

ONLY 1¼-hours or less is required for iron flowing from cupola spout to be transformed into a cleaned and inspected casting at the new, completely mechanized gray iron foundry of Wheeland Co., Chattanooga, Tenn. Since Feb., 1947, the plant has operated on two 8-hour shifts daily, melting approximately 275 tons of iron a day. Output to date has consisted largely of automotive brake drums, made in three sizes, and automotive clutch housings for passenger cars and trucks.

Two structures comprise the foundry. The main building, measuring about 120 x 500-feet, houses the molding, sand preparation, pouring and shakeout operations; cleaning is carried on in a 100 x 200-foot connecting wing. The unit incorporates sand preparation and casting conveyor facilities in the main bay, with molding stations and mold conveyor loops located in the two side bays.

One central sand preparation and distribution system serves both lines. This entire unit is largely duplicated at the opposite end of the building, except that so far only one conveyor loop and battery of molding stations have been installed. Clutch housing and truck brake drums are produced on this second unit. The melting department is conveniently located to the side between the two units. Overhead trolley conveyor lines, about

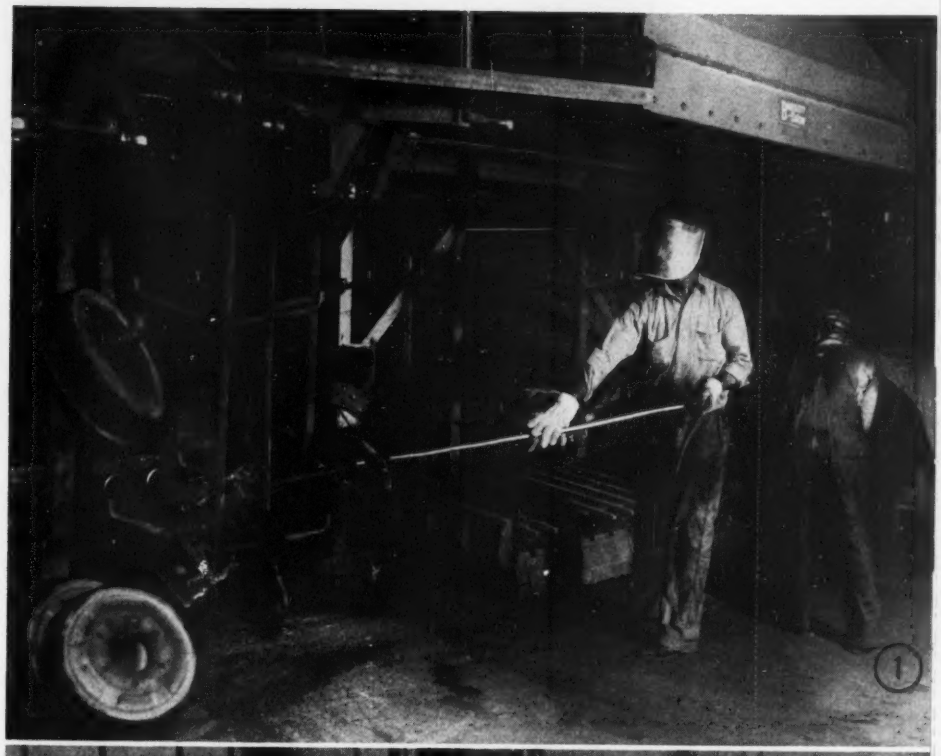


Fig. 1—View of one of the casting shakeouts. Conveyor ascends sharply after leaving the shakeout, moving hot castings above floor level

Fig. 2—Removing cope from a molding machine preparatory to closing a mold on car type conveyor

You wouldn't hire 5 men to do the work of 4 . . .

A-C DOES IT FASTER • CHEAPER • BETTER

FASTER: Ease in using heavier electrodes with higher currents, and the ability to make excellent welds in all positions, assure higher speeds on all classes of work.

CHEAPER: "No-load" losses approximate 15% of d-c; pays for itself in power savings. 85% to 90% electrical efficiency as compared to 55% to 65% for d-c machines.

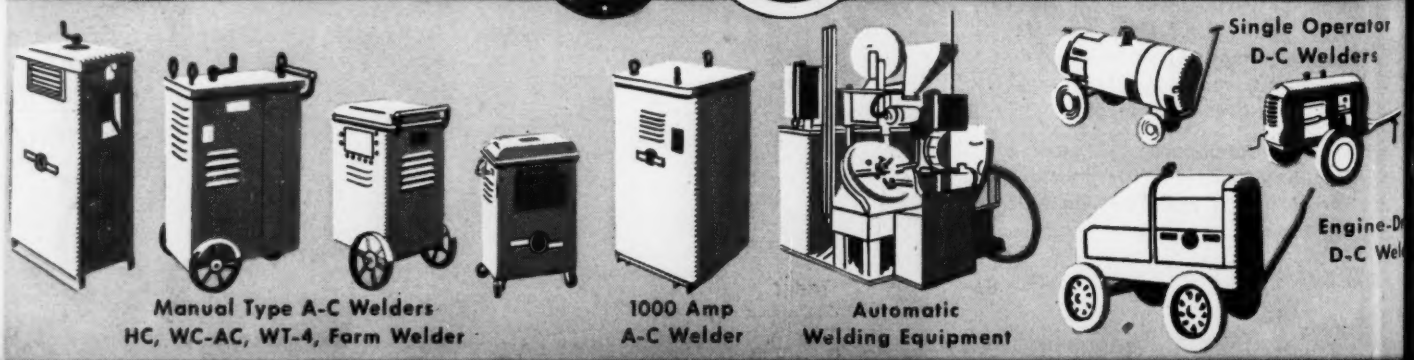
BETTER: Westinghouse A-C Welders eliminate magnetic arc blow—reduce spatter loss—permit welding of heavier sections—assure easy arc control and sounder welds.

WESTINGHOUSE

FOR SUPERIOR WELDING FLEXARC

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE



Manual Type A-C Welders
HC, WC-AC, WT-4, Farm Welder

1000 Amp
A-C Welder

Automatic
Welding Equipment

Single Operator
D-C Welders

Engine-D
D-C Wel

WHEN YOU SELECT AN A-C WELDER

GET THE RIGHT WELDER WITH THE CORRECT RATING

ou wouldn't buy a 500-hp motor to do a 400-hp job. When you itch from d-c to a-c welding, you don't have to buy a 500-ampere c welder to replace a 400-ampere d-c machine.

Westinghouse offers a complete line of a-c welders . . . from the allest to the largest. Each type and size is built to perform in cordance with its rating. For example, the Westinghouse Flexarc 5" 400-ampere A-C Welder is ample to do any job previously per-rmed by a 400-ampere d-c unit. Ampere for ampere, it delivers ted output accurately, continuously . . . and, furthermore, it does is *faster, cheaper and better.*

With Flexarc A-C Welders, you can be sure of rated output in ery instance . . . and you can get a rating to suit the job.

THE FLEXARC "65" GIVES YOU LOW VOLTAGE AND ARC STABILITY

he Flexarc "65" is the new *low-voltage* a-c welder with e *stabilized* arc. It's built to operate with an open-circuit condary voltage of only 65 volts, and overcomes the roblems of arc instability which formerly limited the use f lower a-c voltages for welding. It provides uniform, ontinuous current adjustment. Arc stability is assured over the entire operating range of welding current.

Flexarc "65" Welders are available in 200, 300, 400, 500 and 600-ampere ratings. For full details, see your nearby Westinghouse representative, or mail the handy coupon below. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

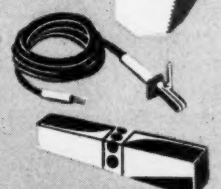
J-21452

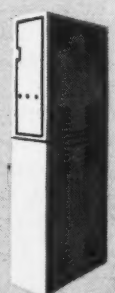
EVERYTHING for Welding ANYTHING!

equency
lizers

Electrodes,
Brazing Alloys
Arc Torch and Accessories

Portable and
Bench-Type Brazers





Resistance Welding Control

MAIL THIS COUPON

Westinghouse Electric Corporation
P. O. Box 868, Pittsburgh 30, Penna.

YES—send me details on the new Westinghouse "65" A-C Welder—also on items checked.

- ☐ Automatic Welding Equipment
- ☐ Engine-driven Welders
- ☐ HF Stabilizers
- ☐ Brazers
- ☐ Electrodes
- ☐ Resistance Welding Control
- ☐ D-C Welders

Name _____

Company _____

Address _____

Fig. 3—Chipping, grinding and inspection of clutch housings after tumbling

3000 feet long, comprise the connecting link between castings production, cleaning and shipment.

Brake drums weighing up to 52 pounds are made in three sizes ranging up to 16 inches in diameter. Both drums and housings are cast two per mold. Each of the two brake drum loops, which extend 209 feet between centers, operates ten jolt-squeeze, strip molding machines—four producing copes and four drags, with the additional pair of machines available as spares. Molding stations are supplied sand from individual overhead hoppers, and molds are set out on a power conveyor by hoists. After the drags are molded, and before they reach the cope stations, the brake drum webs and a strainer core are placed in the molds. These webs or inserts, consisting of steel stampings suitably formed to permit incorporation of the drum in the brake assembly, fuse with the drum itself when the casting is poured.

In mating the web with the drum, webs are first degreased and preheated. They are then placed in the drag accurately and quickly by means of a hand-operated device which picks up two of the inserts at a time from stacked piles. Pins on this device match the flask bushings and permit the operator to locate webs properly in the mold before he releases them.

Barred flasks incorporating four locking wedges on the sides are employed to remove copes from a machine preparatory to being placed on a drag. Hot metal is carried by monorail hoist from the cupola in 2500-pound capacity tapping ladles and transferred to 400-pound pouring ladles. The latter move over monorails along the mold conveyor line. Iron is poured at about 2650° F. Immediately after pouring, the mold train enters a tunnel equipped with an exhaust to remove smoke and gases.

Molds are relatively cool by the time they arrive at a station where the cope is removed and shaken out. The drag proceeds to another shakeout station; castings move forward on the inclined vibrating grid, while drag flasks are vibrated on another conveyor for return to the molding stations. Dust and gases generated at the shakeouts are prevented from drifting out into the plant by an effective exhaust system. Each shakeout is exhausted at the rate of 12,000 cubic feet per minute.

A monorail trolley conveyor passes its "Christmas tree" type carriers over the shakeout grid, and an operator slips the castings onto the carrier hooks. Most gates and runners are broken off the castings by the shakeout vibration and are collected as they fall from the screen.

A simple but effective method is employed for moving the hot castings out of the way as they leave the shakeout. Instead of locating the casting conveyor at the working level —where it would interfere with floor space and the castings would create heat—the conveyor monorail rises sharply and leaves the main foundry building near the ceiling in its passage to the cleaning department.

In the cleaning department the line extends beside three shot blast tables used to clean the brake drums, and the barrels which tumble the clutch housings. Drums are removed from the conveyor and placed over spindles located on individual tables which revolve at the same time the machine's main table is rotated. After one revolution of the main table the castings are turned over to clean the opposite sides and then are returned to the conveyor. Exhaust equipment removing air at the rate of 18,000 cubic feet per minute is connected to the blast tables.

The 12 tumbling mills, each 36 inches in diameter and 6 feet long, are equipped with a 20,000-cubic foot per minute exhaust system with an automatic cutoff which operates when the units are stopped for loading or unloading.

From the cleaning equipment the castings are conveyed past inspection stations where each piece is inspected, chipped and ground and returned to the conveyor which then proceeds to the adjoining shipping dock. There the castings are finally removed and stacked in freight cars for shipment.

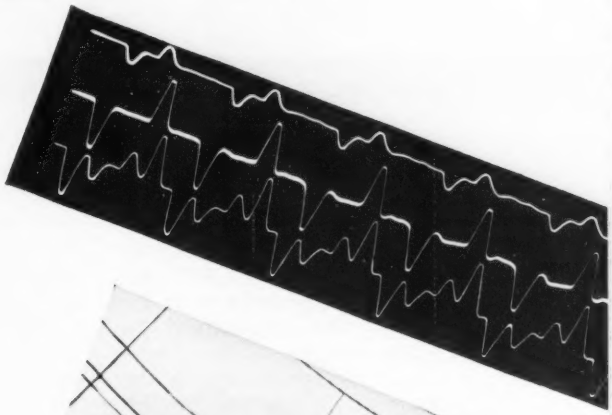
From an article appearing in the June, 1948 issue of THE FOUNDRY.

Use of Trolley Hoist Cuts Handling Time

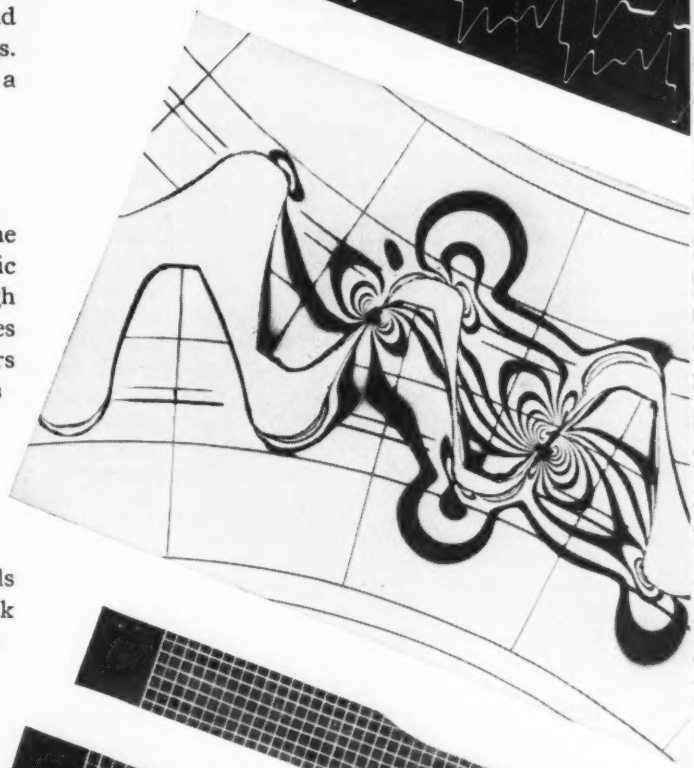
Manual handling and elevator transportation of sheet steel within the plant of Morse Chain Co., Ithaca, N. Y., were eliminated by the use of a trolley hoist made by Yale & Towne Mfg. Co., Philadelphia. Hoist is mounted on an I-beam extending out over the plant yard from the third floor. A long electric cable permits the operator to control raising and lowering of load when hoist is at far end of beam.

Special pickup device is used to further facilitate sheet steel handling. It has three pairs of grips which grasp sheets along each side of stack and hold them stiff during hoisting operations. As much work is being done in one hour as used to be done in eight with the old arrangement.

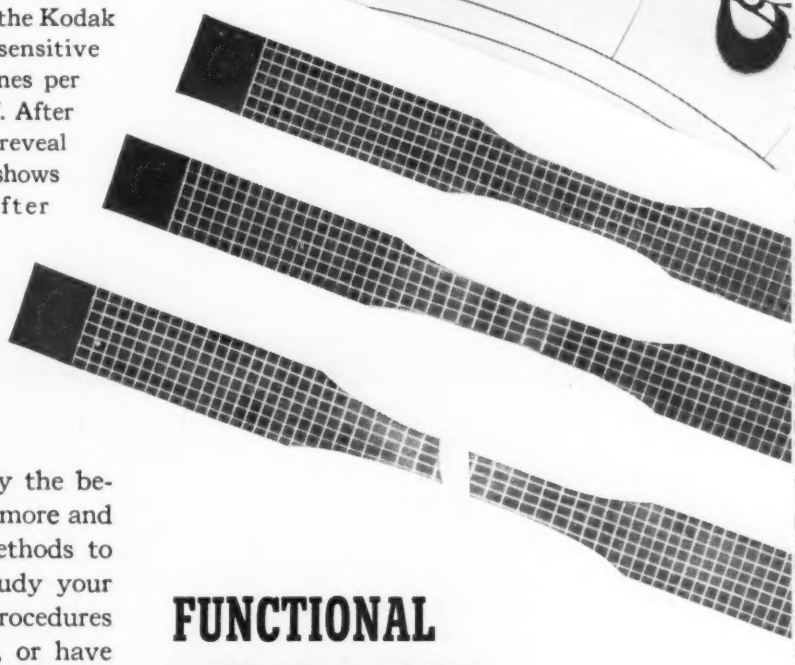
3 ways photography shows the behavior of materials under stress



1. Photographic trace recording to study the behavior of materials under dynamic stress conditions . . . Using bonded wire strain gages coupled to oscillographs, this technic makes it possible to record and measure changes in stress during rapidly applied loadings. This trace recording shows strains at three points along a shouldered bar under longitudinal impact.



2. Photoelastic stress analysis to study the behavior of materials under static or dynamic stress conditions . . . Using polarized light sent through plastic models of the part under test, this technic enables the design engineer to evaluate stress concentration factors and obtain a precise knowledge of actual peak stresses prevailing. This photoelastic stress pattern shows regions of high stress in meshing gears.



3. Photo-grids to study the behavior of materials under tensile stress conditions . . . Using the Kodak Transfax Process, involving a Kodak light-sensitive material, as many as 200 accurately spaced lines per inch may be photoprinted on the material itself. After deformation, measurement of these lines will reveal distribution of plastic flow. This photograph shows photo-grids on a flat tensile specimen after elongation.

Use of photographic technics to help study the behavior of materials under stress is becoming more and more general. Why not look into these methods to determine whether they can be used to study your own products? You can set up these testing procedures relatively inexpensively in your own plant, or have such tests made by any of a number of organizations that specialize in this work. Kodak will be glad to supply you with further details.

Eastman Kodak Company, Rochester 4, N. Y.

"Kodak" is a trade-mark

FUNCTIONAL PHOTOGRAPHY

. . . is advancing industrial technics

Kodak

Forging Practice– *Concluded from Page 64*

ing machine tooling, for the accuracy of the forging depends largely upon good tooling equipment. The final forging machine pass is not necessarily the finishing pass. On some types of forgings, the finishing pass is the one preceding the final pass. In such an instance, the final pass is used to punch the forging bar away from the finished forging, or it may be used to perform a trimming operation to the forging. The forging machine die blocks are made from alloy heat treated steel of a composition similar to the drop forging die blocks. The hardness of the blocks are selected in accordance with the requirements of the machine forging operations. The heading punches are made of high grade tool or die steel, selected for the particular work to be done by the punches. The punches are machined, hardened and tempered, and ground to size after tempering. The first pass is at the top; the forging is moved down with each succeeding pass.

Some types of forgings tend to wear some parts of the die impressions faster than the balance of the impression. It is often possible to insert special wear-resisting or heat-resisting steel at the place where the heavy wear occurs. Pieces of special steel placed in some parts of the regular die blocks are called die inserts. The insert is used for a more uniform wear throughout the particular die impression. Where a set of dies has continuous service on large production runs of forgings, it is desirable at times, where possible, to insert the entire pass impression in the dies, so as to obtain longer life for the set of dies. When the impression insert is worn out, it can be removed and replaced with another impression insert.

Trimming of forgings is not frequent with forgings made on the forging machine. On forgings requiring the development of a small amount of flash, the flash is usually removed by an additional pass on the forging machine. Where a special case occurs on which the trimming operation is separate from the machine forging operation, the trimming and punching tools are made in the same manner as those used for drop forging work.

Forging Press Dies—Dies and tooling for the forging press are designed according to the same laws which govern the movement of plastic metal in the drop forging or in the forging machine forging. It might be desirable to divide the dies for forging press work into two general groups: First, dies in which the forging stock is placed in an upend position in the dies, and second, where the forging stock is placed horizontally or parallel to the die faces. Many symmetrical forgings, such as disks, gear blanks and pinions, flanges and similar parts, are made in one or several steps by placing the stock in a vertical or upend position in each step. The plastic metal spreads outward, and when confined by the impression walls, moves upward. Steps are designed in accordance with rules governing forging machine forgings.

Second group of forgings requires dies similar to drop forging dies, with edging, blocking, and finishing impressions. The forging press is not desirable for performing operations of fullering or drawing stock. Some of the press forgings use blanks that have been given preliminary forging or rolling operations. Forgings that use preliminary operations design the die steps in accordance with the laws of metal movement that govern the making of drop forgings. It is important to avoid folds in the metal in designing the forging steps.

Design of press forging dies permits the use of considerable ingenuity in their construction. Use of a single solid die block for all of the forging steps is desirable in some cases, particularly where two forgings are in two different stages of work and being forged at the same time with one stroke of the press. The forging in the preliminary stage can be used to push the forging in the finishing impression out of the impression and off the die while it is being placed in the finishing impression. Where a solid die is used, the die is solid because it offers greater convenience in the forging operations and not necessarily because the weight of mass of block is required.

For many press forgings, the several forging steps can be designed and machined into individual little blocks, each block containing one of the press forging steps. These individual blocks can be clamped in a die holder or fastened onto the bolster plate. Where the use of the small individual blocks is possible or desirable, it is possible to save considerable time in general machining and in impression machining, on many kinds of press forging dies. Fig. 54 illustrates a set of press forging dies.

Press forgings are usually designed with a minimum of flash for symmetrical parts. The trimming operation is performed on a trimming press in the same manner that drop forgings are trimmed, and the trimming dies and tools are made in like manner. Practically all of the brass and bronze press forgings are forged with but little draft, and many steel press forgings are designed with much less draft than is possible on the drop forging.

Many press forgings can be made with little or no draft by building a "kicker" in the dies so as to force the forging out of the die impression. The kicker is usually some part of the die impression which is built separate from the rest of the impression and which can be moved to eject the forging. The movable part of the die may receive its ejecting movement or "kick" by mechanical means, with suitable linkage being connected to the ram or stroke of the press, or by the use of compressed air which can be exerted on the kicker at the right time. The hydraulic cylinder offers another means of providing the kicking pressure.

(To be continued)

Transfer Machine Speeds Cylinder Block Facing

Development of a special machine tool for facing cylinder block assemblies at a production rate has been announced by Cross Co., Detroit 7. The tool, one of Cross' Transfermatics, finishes the transmission joint face square with the crankshaft bore at the rate of 56 per hour.

Because parts are handled in multiples by a transfer mechanism, with three blocks being faced simultaneously, the machine is said to reduce production costs and to increase output per man-hour. The operator is relieved of all lifting since the blocks move through the machine on a conveyor with the help of the automatic power transfer mechanism. Locating and clamping of the work is also automatic.

Standard for Wire Rope Sent Out for Approval

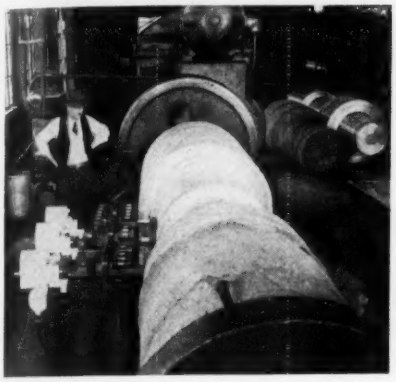
Commodity Standards Division, National Bureau of Standards, Washington, has submitted a recommended commercial standard for wire rope (export classification) to producers and exporters for acceptance.

Proposed by the Wire Rope Institute, the recommended commercial standard gives material requirements, constructions, methods of test, and definitions, safety factors and glossary of terms for the export trade.

New Products and Equipment

Automatic Tool Feed

Uniform and exact rate of tool feed is insured by a roll lathe automatic tool feed recently developed by United Engineering & Foundry Co., Pittsburgh, Pa. Known as Rollafeed, the new 110-pound unit is portable and designed for easy attachment to tool rests of new or existing roll lathes. The feed pushes tool into work in exactly the same manner as this operation is performed by the roll turner; same tools, wedges, supports, etc., are utilized.



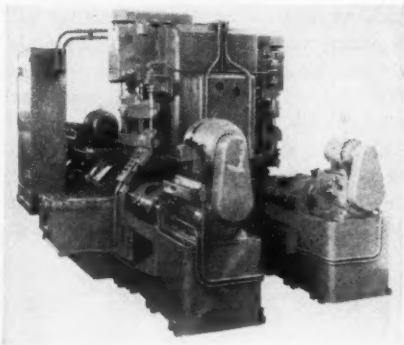
Feeding mechanism is actuated by air pulsations from existing mill air supply which are controlled by a headstock-driven cam. Desired rate of feed is selected from a range of ten steps built into the unit. Provision is made for throwing the automatic feed out of engagement to permit the operator to feed the tool by hand, if desired, when approaching final dimensions. Units may be used in multiple and operated as closely as 9-inch center dimensions. Actual time studies show as much as 48 per cent savings in roll turning time.

Check No. 1 on Reply Card for more Details

Drilling Machine

Used to drill ends and top surfaces of automotive cylinder blocks, five-station, 74-spindle line process hydraulic feed type drilling machine is built by LeMaire Tool & Mfg. Co., 2657 South Telegraph Road, Dearborn, Mich. Machine consists of a rigid fabricated center base, vertical straddle type column and four end bases, two of which are mounted at either side of main base. All units carry multiple spindle drill heads with movable guide bushing plates mounted on two ample size guide bars. Cylinder blocks are carried through machine from station to station on hardened steel rails by means of a hydraulically-actuated traverse bar.

Entire cycle including transfer of work, raising locating pins, clamping, drilling cycle, unclamping and withdrawal of locating pins, is automatically carried through after the

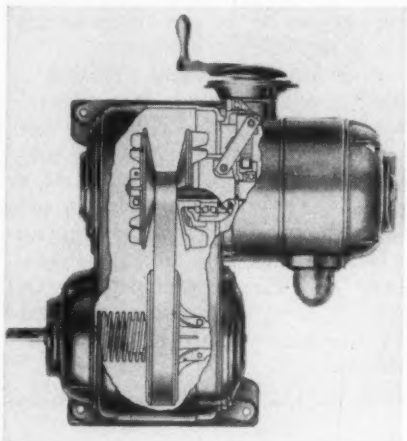


operator has placed a block in position and pressed cycle button. Production is approximately 63 "V-8" blocks per hour.

Check No. 2 on Reply Card for more Details

Variable Speed Motor

Accurate, nonfluctuating speeds over a wide range are instantly available with the type VEU-GH single reduction Varidrive motor, built by U. S. Electrical Motors Inc., 200 East Slauson Ave., Los Angeles 54, Calif. Greater production can be obtained



by adjusting to changing needs without stopping machine. A one-piece Varibelt, permanently aligned and automatically tensioned, transmits power smoothly and absorbs load shocks and vibration.

There are no electrical contacts or brushes to be replaced. Enclosed, dripproof housing protects against falling objects. The type VEU-GH Varidrive is one of a series comprised of horizontal and upright models with speeds from 1 to 10,000 revolutions per minute and from ¼ to 50 horsepower. Speed ratings range up to 7 to 1. All operating parts are amply lubricated and ball bearings are liberally used.

Check No. 3 on Reply Card for more Details

Solution Cleaning Units

Continuous 24-hour cleaning of bright, dull, hot and Watts nickel solutions and eventually acid copper solutions is possible with new special purpose electrolyzing units, recently introduced by Richardson-Allen Corp., 15 West 20th St., New York, N. Y. For 24-hour cleaning, output of these

units can be connected to a small auxiliary tank and pump. Solution is then continually pumped to the auxiliary cleaning tank during working hours, cleaned and pumped back to the main tank.

Since the rectifier is convection-cooled, no maintenance is necessary. Stepless controls permit any voltage control from 0 to 1 volt. Models offered include 1-volt 50 amperes; 1-volt 100 amperes; 1-volt 200 amperes. Units are small and compact. A 1-volt 50 ampere unit weighs 75 pounds, measures 15 x 9 x 17 inches.

Check No. 4 on Reply Card for more Details

Magnetic Starter

Development of Bulletin 4111 size 1 alternating current magnetic starters for nonreversing, across-the-line starting of polyphase squirrel cage induction motors and single phase motors is announced by Ward Leonard Electric Co., Mount Vernon, N. Y. Designed in accordance with Underwriters' Laboratories Inc. and NEMA standards for industrial con-

trol, the starters are available with open type construction or with NEMA type 1 general purpose enclosures.

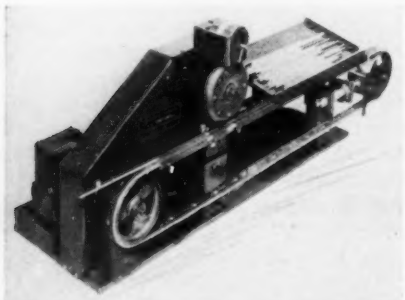
They are suitable for use with separate pilot devices for two or three wire remote control or can be supplied with local control pushbutton stations or selector switches. Features

include compact unit construction, high arc interruption capacity, fast operation, reliable thermal overload protection and accessibility of parts. Maximum enclosed rating is 7½-horsepower, 440-550 volts, three-phase, 60 cycles.

Check No. 5 on Reply Card for more Details

Rod Marking Machine

Automatic printing of welding rods, solder bars, short length tubing and similar ferrous and nonferrous products of ⅛ to 2-inch diameter may be performed on the new motor



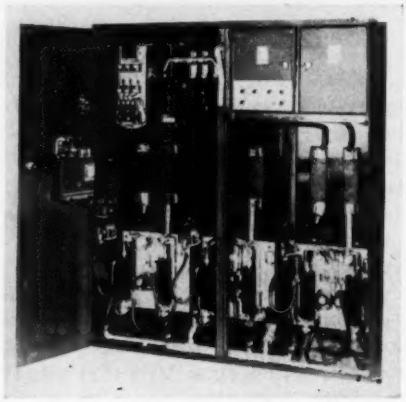
driven marking machine announced by Pannier Corp., 220 Pannier Bldg., Pittsburgh 12, Pa. The No. C-1055-A machine handles uniform and irregular lengths from 2 to 24 inches, operating continuously or intermittently at the rate of 72 feet per minute.

Machine is powered by a ¼-horsepower motor and is equipped with quick-change printing wheel, hopper feed, belt conveyor, automatic ink fountain and adjustments for wear. Printing wheel and conveyor are synchronized. A choice of dovetail rubber wire dies, quickset rubber dies or interchangeable National rubber type is offered.

Check No. 6 on Reply Card for more Details

Welding Control

A variety of multiple welding sequences, weld No. 1, 2 or 3, cascade or simultaneous, with independent dial adjustment of weld time on each phase is provided by the model 312KS2 3-phase multiple control combination, made by Weltronic Co., 19508 West Eight Mile Rd., Detroit 19, Mich. Automatic control circuit



protection is incorporated. A built-in disconnect switch or circuit breaker is available so power may be wired directly to the unit. Interrupting capacity to 50,000 amps may be supplied.

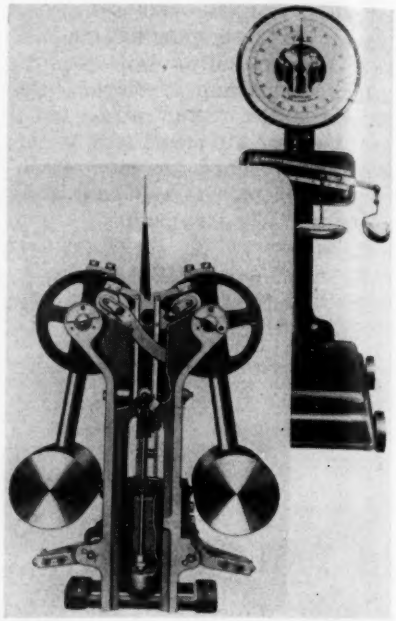
Standard equipment includes a built-in Water Saver, with solenoid operated water valve and water lines housed within the cabinet. A magnetic contactor for remote control, or motor starter is offered and 1 to 3 kilovolt-ampere stepdown transformer is available to supply auxiliary equipment. Complete control over 3, 6 or 9 transformer groups may be accomplished using auxiliary timers.

Check No. 7 on Reply Card for more Details

Dial Scale Mechanism

Magnetrol, a new dial scale mechanism introduced by Yale & Towne Mfg. Co., Philadelphia, Pa., achieves a straight line relationship between the platform load and pointer movement, a reduction of service adjustments and full but light engagement between the pointer rack and pinion by means of a permanent magnet. All moving parts are mounted at three fixed centers in a single gray iron casting, moving on ball bearing surfaces.

Capacity under direct loading without any lever system is 25 pounds. Its application to large industrial loads, up to 50 tons, is a matter of lever linkage. Accuracy is one

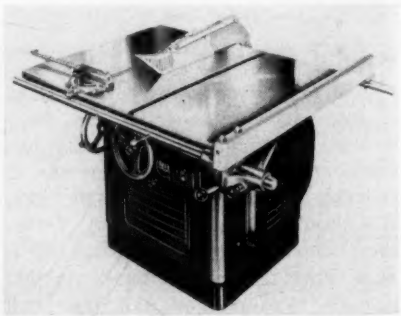


part in 1000. The dial head, with a 20-inch diameter reading-line dial chart, can be swiveled through 360 degrees. Mechanism is protected from moisture, water, dust and neglect.

Check No. 8 on Reply Card for more Details

Tilting Arbor Saw

Delta Manufacturing Division of Rockwell Mfg. Co., 600 East Vienna Ave., Milwaukee 1, Wis., is producing a 12-inch tilting arbor saw capable of handling a wide range of work. It is capable of cutting through 4⅛-inch stock on a square cut and splitting a 4-foot panel into two 24-inch



parallel sections. Straight ripping, cut-off work, miter cutting, rabbeting, grooving, dadoing, sticking, etc., can be performed.

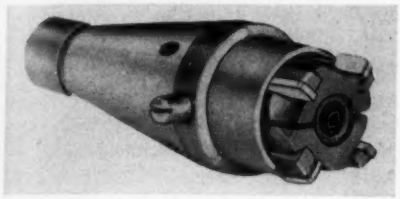
Used with either a 3 or 5 horsepower motor, the saw can be set for speeds of 1800, 2400, 2600 or more revolutions per minute. Carbon and aluminum can be sawed. With both

motor and arbor on a common cradle, the four-belt drive makes the saw flexible. The 12 inch blade can be tilted to the right 45 degrees. The arbor is mounted on lubricated for life ball bearings. Saw table measures 38 inches by 4 feet.

Check No. 9 on Reply Card for more Details

Carbide End Mill

Designed for production milling, another carbide end mill with replaceable blades has been added to the products of W. T. Howald Machine



Works, 182 Sigourney St., Brooklyn 31, N. Y. Manufactured in 1½, 2 and 3 inch diameters, mills have, as an integral part, No. 40 NMTB, Weldon or Brown & Sharpe No. 9 shanks. The replaceable carbide tipped blades are made of standard square stock without serrations, grooves or other limiting elements. Unique cone blade lock permits rapid adjustment to within a few thousandths, minimizing cutter grinding and reducing set-up time.

Check No. 10 on Reply Card for more Details

Dumb Waiter

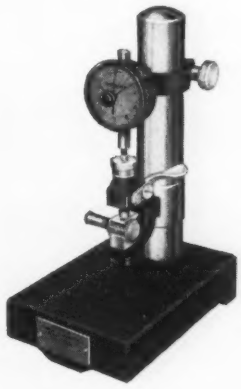
Loads up to 500 pounds and lifting speeds up to 40 feet per minute are possible with the power driven dumb waiters available with full "call" and "send" completely automatic push-button control stations from Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y. Smooth, speedy operation is achieved with wire rope drive through a gear head motor.

Built-in brake and upper and lower limit switches are included. Standard model has a 3 x 3 x 4 foot cab and has a lift of 12 feet. Height may be extended by adding necessary rails and wire rope. Special models of this power-driven unit may be built to order.

Check No. 11 on Reply Card for more Details

Thread Comparator

Recording work visually to accepted ring gage tolerances, the Swanson thread comparator, developed by National Automatic Products Co., New Britain, Conn., tells at a glance whether the product is oversize, undersize, eccentric, tapered or if a lead error exists. The instrument consists of a stand with indicator and standard thread unit. Operations



are: Inserting setting plug, lowering upper anvil with lever, swinging unit under indicator and setting it at tolerance required.

Gage anvils are gage steel, fully heat treated, ground and lapped to class 4 specifications of screw commission standards. Cast iron component parts are reinforced at points

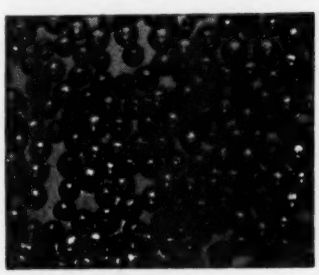
ACCEPTED
BY AMERICA'S LARGEST INDUSTRIAL PLANTS TO DO THE TOUGHEST BLASTING AND PEENING OPERATIONS

HI-GRADE METALLIC

FAMOUS
FOR ITS ABILITY TO STAND UP UNDER REPEATED HARD USE

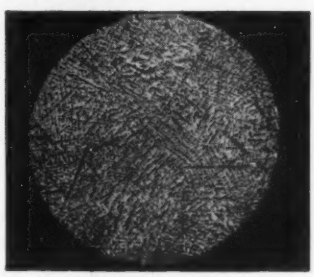
SHOT
- ROUND
- UNIFORM IN SIZE
- UNIFORM IN HARDNESS
- LACKS IRREGULAR SHAPES

GRIT
- RECTANGULAR
- SHARP
- TOUGH
- DURABLE



UNRETOUCHED PHOTO OF HI-GRADE SHOT

CLAYTON-SHERMAN ABRASIVES COMPANY
3896 LONYO ROAD
DETROIT 10, MICHIGAN
CEdar 7200



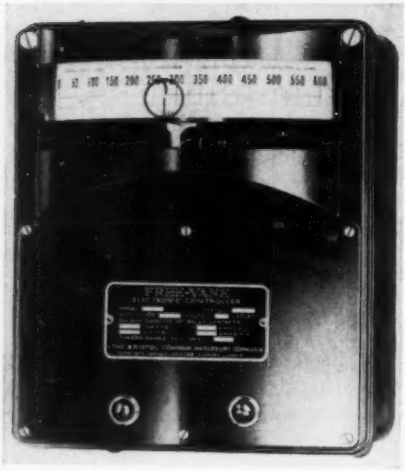
MICROSCOPIC STRUCTURE OF METAL

of contact with precision ground steel parts, hardened and lapped.

Check No. 12 on Reply Card for more Details

Pyrometer Controller

Development of a proportional current-input electronic pyrometer controller is announced by Bristol Co., Waterbury 91, Conn. New instru-



ment, model IE486, proportions current input to electrically-heated furnaces, ovens plastic molding machines, salt pots and other similar equipment to provide practically straight-line temperature control. It does this by time modulation of input energy. Average energy supplied is proportional to deviation of temperature from the control point throughout a band width, which is adjustable from 0 to 2½ per cent of full scale reading.

Check No. 13 on Reply Card for more Details

Magnetic Sweeper

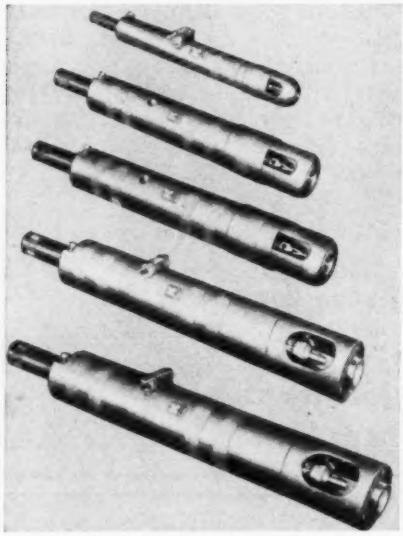
A magnetic sweeper, the Magna-Sweep, made by Dings Magnetic Separator Co., 4740 West McGeogh Ave., Milwaukee 14, Wis., can be used for cleaning up chips in machine shops, picking up nails, tacks, spikes, etc., on loading docks or in parking lots and in keeping foundry gangways free of spills, shot and other iron. It can also be used for reclaiming ferrous scrap. The sweeper consists of a permanent plate magnet, mounted on wheels for pushing over floor or ground.

The Alnico magnet is equally effective on wet or dry surfaces. In operation, the magnet rests on a horizontal nonmagnetic wearing plate to which the iron and steel are attracted and firmly held. To clean, the operator lifts the lever on the handle and the magnet is raised up and away from the wearing plate, allowing the iron to drop off. Sizes with 12 and 24 inch Perma-Plate magnets are available.

Check No. 14 on Reply Card for more Details

Multiple Drilling Tools

Five major units, resulting in 34 speed combinations of stationary and portable units for drilling holes up to ¾-inch diameter in mild steel, aluminum, brass or plastics, are included in the new line of tools for multiple drilling announced by Keller Tool Co., Grand Haven, Mich. The so-called Airfeedrill is a combination of a Keller air drill, air cylinder and



hydraulic dashpot and feed control assembled in one housing and arranged for quick locking progressively in a jig or permanently into a fixture. Intricate jigs or heavy metal bases are not required.

Check No. 15 on Reply Card for more Details

• • •

DRILL PRESS VISES: Hartman Mfg. Co., Racine, Wis., is manufacturing model 400 four-inch and model 600 six-inch drill press vises, all moving parts of which are hardened and ground. Work is held parallel at all times. Locking mechanism, which works on an eccentric, is constructed to compensate for wear.

Check No. 16 on Reply Card for more Details

BRONZE WELDING WIRE: Overlaying of large steel areas for bearing, wearing and corrosion resistant service or for joining aluminum bronze may be performed with bronze bare wire developed for use with submerged arc welding by Ampco Metal Inc., Milwaukee 4, Wis. Ampco-Trode 10 wire is furnished in coils in 1/8 and 3/16-inch diameters.

Check No. 17 on Reply Card for more Details

SCALING HAMMER: Weld flux scaling, weld spatter removal, paint scaling and rust removal are operations which may be performed with the S-1 scaling hammer with lever throttle, announced by Rotor Tool Co., Cleveland 12, O. Varying pressure on lever varies the speed. Exhaust air cleans work of chips and scale. Chisels are furnished in blanks, flats and spoon shapes and star drills are available.

Check No. 18 on Reply Card for more Details

SLIP WASHER: Necessity of removing nuts from bolts to place a spacing washer is eliminated with the Noble slip washer, produced by Mershon Co. Inc., Glendale, Calif. Washer is made in two halves with an overlocking joint. Surface is made in both plain and grip type design for any size bolt.

Check No. 19 on Reply Card for more Details

MASONRY DRILL TIPS: Adamas Carbide Corp., Long Island City 1, N. Y., has designed a line of carbide masonry drill tips for concrete, brick, tile, etc. A full range of sizes is made for both rotary and percussion type drills.

Check No. 20 on Reply Card for more Details

FLOAT SWITCHES: Automatic Control Co., St. Paul 4, Minn., is introducing the type LC-200 plug type and the LCF-200 flange type closed tank float switches. Both are suitable for pressures up to 100 pounds per square inch and temperatures up to 200°F. Both have an adjustable differential from 2 to 6 inches water level.

Check No. 21 on Reply Card for more Details

DIE MACHINE FILES: Alterations or corrections on hardened dies (to rockwell 63C) can be made with ground carbide die machine files, produced by Severance Tool Industries Inc., Saginaw, Mich. Several sizes are offered in four shapes: Round, square, rectangular and triangular.

Check No. 22 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

PRODUCTION—Steel production continued its gradual rise last week and reached 96 per cent of capacity, highest level since the last week of June. Although output has been inching up each week over the last seven weeks from the decline that resulted early in July from holiday and from raw materials shortages growing out of a coal miners' strike earlier in the year it is near its practical capacity and cannot be expected to go much higher. High point thus far this year is 98 per cent attained in only one week, that week along with only three others of 1948 being above the rate of the latest week.

DEMAND—Despite a high national rate of operations and the fact that ingot production this year is exceeding that of 1947, no headway is being made in closing the gap between supply and demand. In fact, the spread may even widen as preparedness programs and steel allocations, superimposed on record-breaking domestic and civilian requirements, gain momentum. Although the voluntary allocations program expires Feb. 28 it is expected it will be renewed inasmuch as the program would hardly be more than well underway then.

Only a few soft spots arise in demand for steel and they are only temporary and local. Carbon steel continues in exceptionally heavy demand. Alloy, the orders for which jumped up markedly earlier this year, is reported now in even stronger demand as preparedness programs begin to take form. Pressure for stainless steel also is heavy, most of the demand coming from producers of domestic goods, although some is from makers of jet engines.

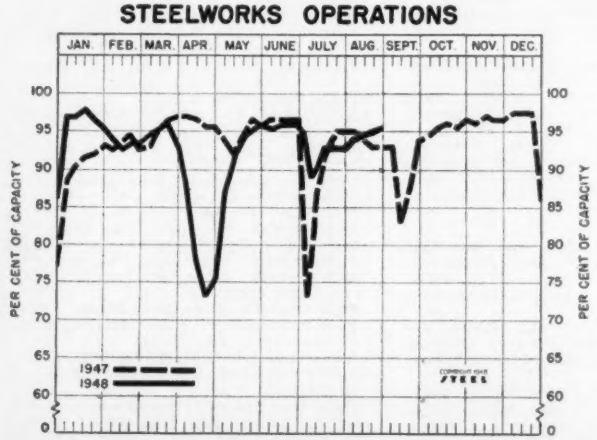
SHIPMENTS—As allocations gain momentum their needs are being tucked into rolling mill schedules, thus forcing other previously scheduled orders aside, with a result shipments on the latter are in some instances being set back. This situation may be intensified as the allocations program takes bigger bites out of the steel supply, and to allow for this contingency, steel producers are trimming future quotas for the general consumer.

WAREHOUSES—Reflecting the record-breaking peacetime demand for steel, inquiries and orders received by warehouses continue in heavy volume. Consequently, warehouse stocks are reported low and unbalanced. While they are offered more orders now than they can fill, warehouses are concerned about their ability to stay in business when a buyers' market in steel returns. This worry stems from the recent adoption, under government pressure, of a steel pricing method in which the buyer pays all freight costs. This places the distant warehouse customer at a disadvantage. Consequently, many warehouses fear they will have to depend almost solely on nearby customers for business, with a result that in areas where there are already many warehouses there will not be enough business to support them all.

PRICES—Only minor price changes were reported last week, they being made to conform with the general increase of several weeks ago. Consequently, STEEL's arithmetical price averages held unchanged last week from the preceding week, and compared with those for the corresponding 1947 week, are: Finished steel, $93.55 and $75.41; semifinished steel, $75.75 and $56.80; steelmaking pig iron, $44.19 and $36.28; steelmaking scrap, $43.33 and $37.38.

PIG IRON—While the government, Kaiser-Frazer Corp. and Republic Steel Corp. sparred over disposition of a Cleveland blast furnace, foundries last week voiced considerable fear that any shift of the furnace operation away from Republic would drastically cut their already critically short supply of pig iron. To supplement the domestic iron supply, foreign shipments at double the domestic prices are coming in, but at such prices the tonnage is being used principally to cover emergencies.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Aug. 28	Change	Same Week 1947	Same Week 1946
Pittsburgh	95.5	+ 1.5	96	96.5
Chicago	95	+ 1	90.5	92
Eastern Pa.	92	+ 1	91	83
Youngstown	103	None	92	89
Wheeling	93	None	89	89
Cleveland	97.5	+ 0.5	94.5	90
Buffalo	101.5	None	88.5	90.5
Birmingham	100	None	99	93
New England	80	— 3	89	86
Cincinnati	106	+ 4	87	84
St. Louis	85	+ 5	82	54.5
Detroit	99	None	92	91
Estimated national rate	96	+ 1	93	90

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Aug. 21	Aug. 14	Month Ago July 1948	Year Ago Aug. 1947	5 Years Ago Aug. 1943
Finished Steel	$93.55	$93.55	$85.58	$75.41	$56.73
Semifinished Steel	75.75	75.75	71.47	56.80	36.00
Steelmaking Pig Iron	44.19	44.19	41.42	36.06	23.00
Steelmaking Scrap	43.33	43.33	41.43	39.00	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

July 1948	3.792[illegible]6c
June 1948	3.577[illegible]0c
July 1947	3.200[illegible]8c
July 1943	2.458[illegible]0c

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

†FINISHED STEEL WEIGHTED COMPOSITE: Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. July, 1948, figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	Aug. 28, 1948	July 1948	May 1948	Aug. 1947
Steel bars, Pittsburgh mills	3.45c	3.105c	2.875c	2.90c
Steel bars, del. Philadelphia	3.79	3.545	3.365	3.28
Steel bars, Chicago mills	3.35	3.065	2.875	2.90
Shapes, Pittsburgh mills	3.25	2.975	2.775	2.80
Shapes, Chicago mills	3.25	2.965	2.775	2.80
Shapes, del. Philadelphia	3.48	3.18	2.98	2.94
Plates, Pittsburgh mills	3.50	3.155	2.925	2.95
Plates, Chicago mills	3.40	3.115	2.925	2.95
Plates, del. Philadelphia	3.71	3.41	3.21	3.15
Sheets, hot-rolled, Pittsburgh mills	3.275	2.975	2.775	2.80
Sheets, cold-rolled, Pittsburgh	4.00	3.70	3.50	3.55
Sheets, No. 10 galv., Pittsburgh	4.40	4.10	3.90	3.90
Sheets, hot-rolled, Gary mills	3.25	2.965	2.775	2.80
Sheets, cold-rolled, Gary mills	4.00	3.70	3.50	3.55
Sheets, No. 10 galv., Gary mills	4.40	4.10	3.90	3.90
Strip, hot-rolled, Pittsburgh mills	3.275	3.140	3.05	2.80
Strip, cold-rolled, Pittsburgh mills	4.00	3.875	3.775	3.55
Bright basic wire, Pittsburgh	4.15	3.965	3.725	3.675
Wire nails, Pittsburgh mills	5.20	5.25	5.125	4.25
Tin plate, per base box, Pitts. dist.	$6.70	$6.68	$6.60	$5.75

Semifinished

Sheet bars, mill	$67.00*	$62.80	$60.00	$53.57
Slabs, Pittsburgh, Chicago	52.00	47.80	45.00	40.18
Rerolling billets, Pittsburgh	52.00	47.80	45.00	40.18
Wire rod 5/32 to ¼-inch, Pitts. dist.	3.775c	3.419c	3.175c	2.925c

* Nominal.

Pig Iron

	Aug. 28, 1948	July 1948	May 1948	Aug. 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$44.08	$41.038	$37.83
Basic, Valley	43.00	40.60	39.00	36.00
Basic, eastern del. Philadelphia	46.17	43.77	42.17	38.72
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	43.58	40.538	37.33
No. 2 fdry., del. Philadelphia	46.67	44.27	42.67	39.22
No. 2 foundry, Chicago	43.25	41.10	39.00	36.00
No. 2 foundry, Valley	43.50	41.10	39.50	36.50
Southern No. 2 Birmingham	43.38	40.72	38.63	34.51
Southern No. 2 del. Cincinnati	49.09	46.43	43.90	39.38
Malleable, Valley	43.50	40.30	39.50	36.50
Malleable, Chicago	43.50	41.50	39.50	36.50
Charcoal, low phos., fob Lyles, Tenn.	62.00	59.60	56.50	44.00
Ferromanganese, fob cars, Pittsburgh	148.00*	151.15	151.15	140.25

* F.o.b. Aetna, Pa.

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$42.75	$40.75	$40.25	$39.50
Heavy melt. steel, No. 2, E. Pa.	41.50	40.00	39.00	38.35
Heavy melt. steel, No. 1 Chicago	41.75	40.05	39.25	39.625
Heavy melt. steel, No. 1 Valley	42.75	40.75	40.25	40.50
Heavy melt. steel, No. 1, Cleveland	42.25	40.25	39.75	38.81
Heavy melt. steel, No. 1 Buffalo	47.50	44.30	43.00	40.88
Rails for rerolling, Chicago	64.25	57.80	51.75	47.125
No. 1 cast, Chicago	70.00	68.50	66.00	43.50

Coke

Connellsville, beehive furnace	$14.50	$14.25	$12.94	$12.00
Connellsville, beehive foundry	17.00	17.00	15.06	14.50
Chicago, oven foundry, ovens	20.40	20.75	18.50	18.50

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $100-105 per gross ton. Forging quality $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except $62, Conshohocken, Pa., mill; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $68, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $110-$115 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & 5/16-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Portsmouth, O., Los Angeles; 4.15c, Monessen, Pa. Basic open-hearth and bessemer, not resulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size): 3.35c, mill, except: 3.55c, Ecorse, Mich., Monessen, Aliquippa, Pa., 3.35-3.55c, Pittsburgh; 4.05c, Pittsburg and Torrance, Calif.; 4.10c, Atlanta, Ga., S. San Francisco, Los Angeles, Niles, Calif., Seattle, Wash., Portland, Oreg.; 5.30c, Fontana, Calif.

Rail Steel Bars: (Base 10 tons): 3.35c mill, except: 4.80c, Williamsport, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 5.50c, Fontana, Calif.

Hot-Rolled Alloy Bar Shapes: 4.00c, mill.

Cold-Finished Carbon Bars (Base 20,000-39,999 lb): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.10c, Youngstown; 4.20c, Indianapolis; 4.25c, Monessen, Pa.; 4.30c, Ecorse, Mich.; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Mass., 4.45c, Camden, N. J.; 5.30 Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.75c, Monessen, Pa., mill; 4.95c, Worcester, Mass., Hartford, Conn., mills.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.40c, Ecorse, Mich., mill.

Reinforcing Bars (New Billet): To fabricators: 3.35c, mill, except: 3.55c, Monessen, Pa., mill; 4.05c, Pittsburg and Torrance, Calif., mills; 4.10c, Atlanta, Ga., Seattle, S. San Francisco, Los Angeles. To consumers: 4.10c, mill, except: 4.85c, Seattle.

Reinforcing Bars (Rail Steel): 4.65c, mill, except: 5.25c, Huntington, W. Va.; mill.

Iron Bars: Single Refined: 8.60c, (hand puddled), Pittsburgh mill; 9.50c, Economy, Pa., mill. Double Refined: 11.25c (hand puddled), Pittsburgh mill; 11.00c, Economy, Pa., mill. Staybolt: 12.75c, (hand puddled), Pittsburgh mill; 11.30c, Economy, Pa., mill.

Hot-Rolled Ingot Iron Bars: 3.60c, mill.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.25-3.30c, Pittsburgh, Cleveland; 3.45c, Ecorse, Mich.; 3.95c, Pittsburg, Torrance, Calif.; 5.00c, Conshohocken, Pa.; 5.65c, Fontana, Calif.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 4.65c, Niles, O., 5.05c, Torrance, Calif.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Granite City, Ill., and Ecorse, Mich., mills; 4.95c, Pittsburg, Calif., mill.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 4.60c; 5.00c, Niles, O., mill; 5.15c, Pittsburgh and Torrance, Calif.

Galvannealed Sheets: 4.95c, mill, except: 5.55c, Niles, O., mill.

Culvert Sheets, No. 16 flat (based on 5-cent zinc) 4.40c, mill, except: 5.00c, Niles, O.; 5.15c, Pittsburg and Torrance, Calif. Copper-iron: 5.74c mill.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: 7.75c, mill.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Long Ternes Ingot Iron: 5.20c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill., mill; 4.70c, Ecorse, Mich., mill; 6.00c, Niles, O., mill.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.65c, Granite City, Ill., mill; 6.05c, Niles, O., mill. Electrical: Hot-rolled, 5.95c, mill, except: 6.15c, Granite City Ill., mill; 6.55c, Niles, O., mill. Cold-rolled, 6.20c, mill. Motor: 6.70, mill, except: 6.90c, Granite City, Ill., mill; 7.20c, Brackenridge, Pa., mill. Dynamo; 7.50c, mill, except: 7.40c, Follansbee, W. Va., Toronto, O., mills; 7.70c, Granite City, Ill., mill; 7.90c Brackenridge, Pa., mill. Transformer 72, 8.05c, mill, except: 7.90c, Follansbee, W. Va., Toronto, O., mills; 8.90c, Brackenridge, Pa., mill. 65, 8.65c, mill, except: 8.60c, Follansbee, W. Va., Toronto, O., mills; 9.60c, Breckenridge ,Pa., mill. 58, 9.30c, mill, except: 10.30c, Brackenridge, Pa., mill. 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c,mill, except: 5.25c, Ecorse, Mich., and Conshohocken, Pa., mills. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.

Ingot Iron Sheets (18 gage and heavier): Hot-rolled, 3.50c, mill Cold-rolled, 4.50c, mill. Galvanized, 4.65c, mill, except: 4.95c, Indiana Harbor, Ind., mill.

Strip

Hot-Rolled Strip: 3.25c, mill, except: 3.25-3.50c, Chicago, Cleveland, Pittsburgh; 3.25-3.50c* Sharon, Pa.; 3.45c, Ecorse, Mich., Atlanta, Ga.; 3.60c, Detroit; 3.70c, West Leechburg, Pa.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, Wash., S. San Francisco, Los Angeles; 5.90c, Fontana, Calif.

*6 in. and narrower; wider than 6-in., respectively.

Cold-Rolled Strip (0.25 carbon and less): 4.00c, mill, except: 4.00-4.25c, Chicago; 4.20c, Ecorse, Mich.; 4.25c, Warren, O.; 4.40-4.50c, Detroit; 4.50c, New Haven, Conn., West Leechburg, New Castle, Pa.; 4.75c, Dover, O.; 5.75c, Los Angeles; 7.10c, Fontana, Calif.

Hot-Rolled Alloy: 5.10c, mill.

Cold-Rolled Alloy Strip: 9.50c, mill, except 9.80c, Worcester, Mass., mill.

Cold-Finished Spring Steel: 0.26-0.40 carbon, 4.00c, mill; over 0.40 to 0.60 carbon, 5.50c, mill; over 0.60 to 0.80 carbon, 6.10c; over 0.80 to 1.05, 8.05c; over 1.05 to 1.35, 10.35c; add 0.30c for Worcester mill.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.

Tin, Terne Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $6.60-$6.80; 1.50 lb coating $6.80-$7.00. Pittsburg, Calif., mill $7.35 and $7.55, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $5.80-$6.00; 0.50 lb tin, $6.00-$6.20; 0.75 lb tin, $6.20-$6.40.

Can Making Black Plate: Per base box of 100 lb. 55 to 70 lb basis weight, $5.20-$5.30; 75 to 95 lb basis weight, $5.10-$5.20; 100 to 128 lb basis weight, $5.20-$5.30; $5.95, $5.85, $5.95, respectively, Pittsburg, Calif., mill.

Holloware Enameling Black Plate: 29-gage, 4.75-4.95c per lb.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $5.90-$6.10. Granite City, $6.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c. Pittsburgh, Cleveland; 3.45c, Sparrows Point, Md.; 3.60c, Aliquippa, Pa.; 3.65c, Ecorse, Mich.; 3.75c, Coatesville, Pa.; 3.95c, Claymont, Del., Conshohocken, Pa.; 4.80c, Seattle; 5.80c, Fontana, Calif.; 5.85c, Harrisburg, Pa.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.10c, Coatesville, Pa., mill; 5.30c, Conshohocken, Pa., Sparrows Point, Md., and Johnstown, Pa., mills; 5.65c, Ecorse, Mich.

Shapes

Structural Shapes: 3.25c, mill, except 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, Aliquippa, Pa., 3.85c, Torrance, Calif.; 4.30c, Seattle, S. San Francisco, Los Angeles; 5.75c, Fontana, Calif.

Beams, Wide Flange: 3.20c, mill, except: 3.30c, Bethlehem, Aliquippa, Pa. mills.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., and Lackawanna, N. Y., mills.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.00c, Atlanta, Ga., mill; 4.25c, Sparrows Point, Md., mill; 4.45c, Worcester, Mass., mill; 4.50c, Monessen, Pa., mill; 4.70c, Portsmouth, O., mill; 5.10c, Pittsburg, Calif., mill.

Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md., Monessen, Pa., mills; 5.85c, Worcester, Mass., Trenton, N. J., mills; 6.50c, Pittsburg, Calif., mill.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa., mills; 5.50c, Worcester, Mass., Trenton, N. J. New Haven, Conn., mills; 6.15c, Pittsburg, Calif., mill.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90, Sparrows Point, Md., mill; 4.95c, Monessen, Pa., mill; 5.10c, Worcester, Mass., mill; 5.20c, Atlanta, Ga., mill; 5.75c, Pittsburg, Calif., mill. Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md., mill; 5.40c, Monessen, Pa., mill; 5.55c, Worcester, Mass., mill; 5.65c, Atlanta, Ga., mill; 6.20c, Pittsburg, Calif., mill.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Column 103, mill, except: 103-124, Cleveland; 105, Sparrows Point, Md.; 109 Worcester, Mass.; 110 Atlanta, Ga.; 117, Portsmouth, O; 123, Pittsburg, Calif; 126, Monessen, Pa.; $4.77 per 100 lb, Williamsport, Pa.; $5.20 per 100 pound keg, Aliquippa, Pa.; $6.75, Conshohocken, Pa., and Wheeling, W. Va.

Woven Fence (9 to 15½ Gage, inclusive): Column 109, mill, except: 113 Monessen, Pa., mill; 121 Atlanta, Ga., mill; 132, Pittsburg, Calif., mill.

Barbed Wire: Column 123 mill, except: Column 125, Sparrows Point, Md., mill; 126 Atlanta, Ga., mill; 128 Monessen, Pa., mill; 143, Pittsburg, Calif., mill.

Fence Posts (with clamps): Column 114, Duluth; Column 115, Johnstown, Pa.; $123.50 per net ton, Williamsport, Pa.

Bale Ties (single loop): Column 106, mill, except: 108, Sparrows Point, Md., mill; 110, Atlanta, G., mill; 130, Pittsburg, Calif., mill.

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	41½	14	1¼ ...	48–	32–
¼	39½	16½		49	33
⅜	36	12	1½ ...	48½–	32½–
½	42–	24½–		49½	33½
	43	25½	2	49–	33–
¾	45–	28½–		50	34
	46	29½	2½, 3..	49½–	33½–
1	47½–	31½–		50½	34½
	48½	32½	3½ & 4	44½	28

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	39½	23	39	22½	27–	10½–
					38½	22
2½	42½–	26–	42	25½	32½–	16–
	43½	27			41½	25
3	42½–	26–	42	25½	35–	18½–
	43½	27			41½	25
3½ & 4	42½–	26–	44	27½	38½–	22–
	46½	30			43½	27
5 & 6 .	42½–	26–	44	27½	38½–	22–
	44½	28			43½	27
7	..	..	..	..	43½	26

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	40½	...	1¼ ...	47–	31–
¼	38½	...		48	32
⅜	35	...	1½ ...	47½–	31½–
½	41–	23½–		48½	32½
	42	24½	2	48–	32–
¾	44–	27½–		49	33
	45	28½	2½ & 3	48½–	32½–
1	46½–	30½–		49½	33½
	47½	31½	3½ & 4	43½	

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	38½	22	38	..	26–	9½–
					37½	21
2½ ...	41½–	26	41	..	31½–	15–
	42½				40½	24
3	41½–	26	41	..	34–	17½–
	42½				40½	24
3½-6 ..	41½–	25–	44	..	37½–	21–
	45½	29			42½	26
8	45½	..	44½–	..	40½–	23–
			46		44½	27
10	45	..	44–	..	41½–	24–
			45½		44	26½
12	44	..	44½	..	40½–	23–
					43	25½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

	Butt Weld			Lap Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅜...	+59½	+89	1¼..	+22	+46½
½...	+20½	+46	1½..	+15½	+39
¾...	+10½	+35	2....	+ 7½	+30
1 and			2½-3½	+ 5	+25.5
1¼	+ 4½	+26	4....	List	+19½
1½..	— 1½	+22½	4½-8	+ 2	+21
2....	— 2	+22	9-12.	+12	+30½

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

		——Seamless——		—Elec. Weld—	
O.D.	B.W.	Hot	Cold	Hot	Cold
In.	Ga.	Rolled	Drawn	Rolled	Drawn
1	13	....	13.39	13.00	13.00
1¼	13	....	15.87	13.21	15.39
1½	13	$15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2½	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	37.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Rails, Supplies

Rails: Standard, over 60-lb: $3.20 per 100 lb, mill.

Light (billet): $3.55 per 100 lb, mill.

Light (rail steel): $4.70 per 100 lb., Williamsport, Pa.

Relaying, 60 lb and over: $64-$69 per net ton, f.o.b. warehouse.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb., mill. Untreated: $8.25, mill, except: $7.50, Fairfield, Ala., mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Calif.; 4.50c, Seattle, mill.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill, except: 5.25c, Pittsburgh mill.

Axles: 5.20c, mill.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅞ and ⅝ x 6-in. and shorter	37 off
¾-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller	41 off	.....
½-in. and smaller	.....	38 off
½-in.-1-in.	39 off	....
⅞-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	.....	28 off

Additional discount of 15 for full containers

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	40 off
¾, ⅞, & 1 x 6 and shorter	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants,

Structural ½-in. and larger	6.75c
⅞-in. and under	48 off

Washers, Wrought

Fob Pitts., Chicago, Philadelphia, to jobbers and large nut and bolt mfrs.....$1-$2 off

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.5c
18	4	3	...	...	114.5c
18	4	2	...	9	168.5c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

Stainless Steels

Mill prices, cents per lb. New price schedules pending.

Grade	Bars, Wire, Shapes	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301....	28.75	32.50	40.75	24.25	32.00
302....	28.75	32.50	40.75	25.75	33.75
303....	31.50	34.75	43.00	32.50	39.75
304....	31.25	34.75	43.00	28.00	35.75
308....	34.75	40.75	49.00	34.00	43.00
309....	43.00	48.00*	56.25	44.00	56.25
310....	59.00	62.25†	63.25	52.25	57.25
316....	48.00	53.00	57.25	47.85	57.25
317....	60.00	64.50	69.50	....	39.50
321....	34.75	40.75	49.00	35.25	45.75
347....	39.75	45.75	54.00	39.50	50.25
403....	26.00	29.75	35.25	....	32.50
405....	24.25	27.50	33.75	....	32.00
STRAIGHT CHROMIUM STEEL					
410, 414	22.75	26.00	32.00	20.25	26.50
416....	23.25	26.50	32.50	22.00	28.25
420....	28.75	34.25	40.25	28.50	43.50
430....	23.25	26.50	34.75	21.00	27.00
430F ..	23.75	27.00	35.25	22.50	29.75
431....	23.25	26.50	34.75	....	27.00
440A, B, C	28.75	34.25	40.25	....	43.50
442....	27.00	31.00	39.25	....	38.50
446....	33.00	36.50	46.50	....	62.25
501§...	10.00	14.50	19.25	14.25	20.50
502§...	11.00	16.00	20.50	16.00	21.50

§ Low chromium.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$44.00	$44.50	$45.00	$45.50
Newark, N. J., del.	46.39	46.89	47.39	47.89
Brooklyn, N. Y., del.	....	48.40	48.90	....
Philadelphia, del.	46.17	46.67	47.17	47.67
Birmingham, furnace	42.88	43.38	....	....
Cincinnati, del.	....	49.09	....	....
Buffalo, furnace	44.00	44.00	44.50	45.00
Boston, del.	52.42	52.42	52.92	....
Rochester, del.	46.22	46.22	46.72	47.22
Syracuse, del.	47.025	47.025	47.525	48.025
Chicago, furnace	42.50-43.00	43.00-43.50	43.50	44.00
Milwaukee, del.	44.22-44.72	44.72-45.22	45.22	45.72
Muskegon, Mich., del.	....	49.65-50.15	50.15	....
Cleveland, furnace	43.00	43.50	43.50	44.00
Akron, del.	45.17	45.67	45.67	46.17
Duluth, furnace	43.00	43.50	44.00	44.50
Erie, Pa., furnace	42.50	43.00	43.50	44.00
Everett, Mass., furnace	....	48.75	49.25	....
Geneva, Utah, furnace	43.00	43.50	....	....
Seattle, Tacoma, Wash., del.	....	50.63	....	....
Portland, Oreg., del.	....	50.63	....	....
Los Angeles, San Francisco.	50.13	50.63	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	48.65	49.15	49.65	....
Ironton, Utah, furnace	....	43.50	....	....
‡Neville Island, Pa., furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	43.00	43.50	43.50	44.00
Sharpsville, Pa., furnace	43.00	43.50	43.50	44.00
Steelton, Pa., furnace	44.00	44.50	45.00	45.50
Struthers, O., furnace	42.50	....	....	....
Swedeland, Pa., furnace	50.00	50.50	51.00	....
Toledo, O., furnace	42.50	43.00	43.50	44.00
Cincinnati, del.	47.05	47.55	....	....
Youngstown, O., furnace	43.00	43.50	43.50	44.00
Mansfield, O.	46.87	47.37	47.37	47.87

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base).$56.50
6.51-7.00.. 57.75 9.01- 9.50. 64.00
7.01-7.50.. 59.00 9.51-10.00. 65.25
7.51-8.00.. 60.25 10.01-10.50. 66.50
8.01-8.50.. 61.50 10.51-11.00. 67.75
8.51-9.00.. 62.75 11.01-11.50. 69.00

Fob Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $81.75 furnace, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.....$62 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $50. Philadelphia $52.81, delivered. Intermediate phosphorus, Central furnace, Cleveland, $48.00.

Differentials

Prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace . $13.50-15.50
Connellsville, foundry. 16.00- 18.00
New River, foundry... 16.50
Wise county, foundry.. 15.35
Wise county, furnace.. 14.60
† Nominal.

Oven Foundry Coke

Kearney, N. J., ovens. $21.50
Chicago, ovens 20.40
Terre Haute, ovens.... 21.00
Milwaukee, ovens 21.15
New England, del..... 22.75
Birmingham, del. 17.86
Indianapolis, ovens ... 20.85
Cincinnati, del. 21.40
Ironton, O., ovens 18.25
Erie, Pa., del. 22.45
Painesville, O., ovens.. 20.90
Cleveland, del. 22.45
Buffalo, del. 23.10
Detroit, del. 21.65
Philadelphia, ovens ... 20.55
Swedeland, Pa., ovens . 20.50
Portsmouth, O., ovens. 19.25

Coal Chemicals

Spot, cents per gallon, ovens
(Price effective as of Aug. 5)

Pure benzol 20.00
Toluol, one degree 20.50-26.50
Toluol, two degrees ... 23.00-26.50
Industrial xylol 20.50-26.50

Per pound, ovens

Phenol, 40 (car lots, returnable drums) 13.00
Do., less than carlots 13.75
Do., tank cars 12.00
Naphthalene flakes, balls, bbl. to jobbers, "household use" 12.00

Per ton, bulk, ovens

Sulphate of ammonia . $45.00

Refractories

(Prices per 1000 brick, fob plant)

Fire Clay Brick

Super Duty: St.Louis, Vandalia, or Farber, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $100.

High-Heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, or Vandalia, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., $80.

Intermediate-Heat Duty; St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, Haldeman, or Athens, Ky., Troup, Tex., Stevens Pottery, Ga., or Portsmouth, O., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Pa., Bessemer, Ala., $66.

Ladle Brick

Dry Press: $50.
Wire Cut: $48.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $83; Beach Creek, Pa., $73.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., $89; Lehi, Utah, Los Angeles, $95.
Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., $80.
Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.) Chrome brick or chemical-bonded chrome brick, $69, magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, fob works, Chewelah, Wash.)
Domestic dead-burned, ⅜" grains: Bulk, $31; single paper bags, $35.50.

Dolomite

(Base prices per net ton)
Domestic, dead-burned, bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibonsburg, Woodville, O., $11.85; Thornton, McCook, Ill., $11.95; Dolly Siding, Bonne Terre, Mo., $12.05.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer $6.60
Old range nonbessemer 6.45
Mesabi bessemer 6.35
Mesabi nonbessemer 6.20
High phosphorus 6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract 15.25

Foreign Ore

Cents per unit, cif Atlantic ports

Swedish basic, 60 to 68% 14.50
Brazil iron ore, 68-69% 18.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid ..... $26-$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African
48% 2.8:1 ..... $37.50
48% 3:1 ..... 39.00
48% no ratio 31.00

South African (Transvaal)
44% no ratio .....$25.50-$26.00
45% no ratio 26.50
48% no ratio 29.00-30.00
50% no ratio 29.50-30.50

Brazilian—nominal
44% to 2.5:1 lump..... $33.65

Rhodesian
45% no ratio .....$27-$27.50
48% no ratio 30.00
48% 3:1 lump 39.00

Domestic (seller's nearest rail)
48% 3:1 ..... $39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines $0.75

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅜" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Standard Structural Shapes	Carbon ⅜"-¾"	Floor ¾" & Thicker
Boston (city)	5.84	6.64	7.84	6.04	6.90	5.69	6.39	8.24	5.54	5.89	7.34
Boston (c'try)	5.69	6.49	7.69	5.89	...	5.54	6.24	8.09	5.39	5.74	7.19
New York (city)	5.73-5.80	6.73	7.74-7.83	6.08-6.28	...	5.83	6.58	8.22	5.52-5-78	5.98	7.48
New York (c'try)	5.53-5.60	6.53	7.54-7.63	5.88-6.08	...	5.63	6.38	...	5.32-5.58	5.78	7.28
Phila. (city)	5.50-5.86	6.61-6.81	7.42-7.62	5.60	...	5.57-5.65	6.31	7.94	5.24-5.35	5.52-5.65	7.16
Phila. (c'try)	5.35-5.71	6.46-6.66	7.27-7.47	5.45	...	5.42-5.50	6.16	7.79	5.09-5.20	5.37-5.50	7.01
Balt. (city)	5.43†	6.33	7.53	5.49	...	5.54	...	...	5.48	5.68	7.13
Balt. (c'try)	5.28†	6.18	7.38	5.34	...	5.39	...	...	5.33	5.33	6.98
Norfolk, Va.	5.75	...	...	...	...	6.00	7.00	...	6.00	6.00	7.50
Buffalo (city)	5.25	6.00[5]	7.75	5.70	...	5.35	6.05	...	5.25	5.61	...
Buffalo (c'try)	5.10	5.85[5]	7.60	5.55	...	5.20	5.90	...	5.10	5.46	...
Pitts (w'house)	4.85-5.00§	5.75-5.85[5]	7.00-7.05	5.00-5.35	5.95-6.00	4.90-5.10	5.65	7.65	4.90-5.15	5.05-5.25	6.55
Detroit (w'house)	5.40§	6.30	7.60	5.40	...	5.45	6.17	8.12	5.45	5.65	7.10
Cleveland (del.)	5.13-5.29	6.00-6.29	7.34-7.49	5.17-5.69	6.85	5.30-5.34	6.05-6.10	7.94-8.29	5.34-5.60	5.50-5.54	6.95-6.99
Cleveland (w'hse)	4.98-5.75	5.75-6.14	7.19-7.85	5.02-5.54	6.70	5.15-5.19	5.90-5.95	7.79-8.14	5.19-5.45	5.35-5.39	6.80-6.84
Cincinnati (w'hse)	5.26	6.11	7.60	5.52	6.07	5.52	6.07	...	5.37	5.61	6.91
Chicago (city)	5.20	5.90‡[5]	7.20	5.00	6.30	5.05	5.85	7.80[9]	5.05	5.25	6.70
Chicago (w'house)	5.05	5.75‡[5]	7.05	4.85	6.15	4.90	5.70	7.65[9]	4.90	5.10	6.55
Milwaukee (city)	5.37	6.07‡[5]	7.37	5.17	6.47	5.22	6.02	7.97[9]	5.22	5.42	6.87
St. Louis	5.19§	6.09[8]	7.29	5.19	6.49	5.24	6.04[12]	9.49	5.24	5.44	6.89
Birm'ham (city)	5.20§	...	6.60	5.20	...	5.15	6.66	...	5.15	5.40	7.41
Birm'ham (c'try)	5.05§	...	6.45	5.05	...	5.00	6.51	...	5.00	5.25	7.26
Omaha, Nebr.	6.07	...	9.33	6.07	...	6.12	6.92	...	6.12	6.32	7.77
Los Angeles (city)	6.55§	8.05	8.20†	6.75	9.50	6.20	8.00-8.50	...	6.70	6.40	8.15
Los Angeles (w'house)	6.40§	7.90	8.05†	6.60	9.35	6.05	7.85-8.35	...	6.55	6.25	8.00
Seattle-Tacoma	6.35[17]	7.90[5]	8.40	6.70[17]	...	6.20[17]	8.15[1]	9.45[2]	6.30[17]	6.35[17]	8.40[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [15]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb; [23]—Price (but not other price in range) applies to any and all quantities.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $57, Palmerton, Pa., $56, Pittsburgh and Chicago; (16% to 19% Mn.) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, Alloy, W. Va., Welland Ont., Sheridan, Pa., and Lynchburg, Va.; $147 Johnstown, Pa., mill. Carload, lump, bulk, $150 fob Rockwood, Tenn.; $148 fob Aetna, Pa. Add or subtract $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l. Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%. C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 20.1c per lb of contained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C 25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D; packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c, for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

20-30% Ferrosilicon: Contract, carload, lump, bulk, 16.50c per lb of contained Si, fob Niagara Falls, N. Y.

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si, carload packed 10.9c, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c, for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c. Central, add 0.3c for c.l. and 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained Si, carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si, carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe.) Eastern Zone c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c smaller lots 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c, ton lot 14.0c, less ton 14.9c; Central, add 0.25c for

(*Please turn to Page 120*)

Stockpiling To Be Accelerated

Munitions Board seeks immediate action through co-operation of industry on procurement of 30 items, including copper, lead zinc, tin and other highly critical materials

New York—Munitions Board has requested co-operation of industry in accelerating the stockpiling of strategic materials which are deemed essential for the nation's military security. While a total of 67 materials are included in Group A, the Munitions Board is urging prompt action on only 30 of these items.

The Group A list comprises those strategic items for which stockpiling "is deemed the only satisfactory means of insuring an adequate supply for a future emergency." The list of 30 materials receiving special attention at this time include the following metals and ores: Lead, copper, zinc, tin, tungsten, vanadium, nickel, cadmium, manganese, bauxite, bismuth, chromite, columbite, corundum, industrial diamonds, kyanite, and monazite.

A series of informal meetings with representatives of industries which use the critical materials are being planned here. Methods of industry co-operation in speeding the stockpiling will be outlined by Earl Bunting, managing director of the National Association of Manufacturers, R. Webb Sparks, assistant director of the National Industrial Council for the manufacturing trade associations group, and industrial association representatives.

Under the industry-assistance plan, formulated by Thomas J. Hargrave, Munitions Board chairman, and Mr. Bunting, procurement of the critical items will be increased through the co-operation of industries which import, produce, or process the needed materials. These industries are being asked to obtain for the government a certain percentage in excess of their normal supply.

Required amounts of the materials vary considerably, Mr. Bunting said, but as an average they represent a "very small percentage of the national production each year." No significant inflationary effect is anticipated from the stockpiling, he said, emphasizing that purchase of the materials in an orderly fashion, by men accustomed to buying and processing them, should eliminate any disturbing competitive bidding for the products in the world markets, on the part of government and industry.

Copper—Plant closings in July for vacations in the brass, wire and other copper consuming industries had an adverse effect on copper consumption last month. Approximately 16,000 less tons were used in July than in June to put total consumption at 103,540 tons, lowest for this year, but still comparing favorably with July, 1947, consumption of only 87,312 tons. There also was a sharp reduction in new business booked last month by copper goods makers, following the heavy bookings in June when customers of the brass mills increased their orders in anticipation of copper products price boosts, which since have materialized. New business booked during July was placed at 119,096 tons, a drop of 28,688 tons compared with June bookings requiring 147,784 tons of copper. The trade noted that even though new orders last month were sharply below June, the total was well ahead of the actual use of copper in July and about equaled the amount used in June deliveries of copper goods. Receipts of refined copper last month by makers of copper products totaled 110,361 tons from domestic and foreign sources. These receipts compare with 112,674 tons received in June. In July, for the first time since the war ended, there were no deliveries of the metal to industry from the stocks held by the Office of Metals Reserve. The June copper deliveries to industrial users included 900 tons of government-owned metal.

Manufacturers of copper and brass products at the end of July had unfilled orders on hand totaling 349,767 tons, an increase of 15,556 tons over unfilled orders on hand at the end of July.

Total copper needs of the makers of copper goods at the end of July amounted to 644,366 tons. To meet these requirements, they had on hand or on order 506,929 tons. Apparent deficit of 137,441 tons at the end of July compares with an apparent deficit of 127,998 tons at the end of June.

Lead—Australia, Mexican and Canadian lead is selling here at levels equivalent to the domestic market, but metal of European origin is quoted at a premium. Total tonnage of metal offered is far below the volume sought by consumers. Domestic supplies are curtailed by scattered strikes in the western producing districts.

Zinc — An increasingly tight supply situation is developing in the slab zinc market due to continued shutdown of several western plants by strikes. At present, there is no indication of an early settlement of the labor trouble. Therefore, the undertone of the market is described as strong.

Recovery of secondary zinc in all zinc-base products declined 6 per cent in April, according to the Bureau of Mines. Consumers of zinc scrap reported a total recovery of 13,543 short tons compared with 14,425 tons in March.

The quantity of zinc scrap consumed dropped 6 per cent to 19,745 tons in April. Treatment of galvanized dross, skimmings and ashes, new clippings, and flue dust decreased 1021 tons, 539 tons, 325 tons, and 299 tons, respectively. The use of die-cast skimmings declined 169 tons, and the quantity of old zinc consumed dropped 166 tons. Partially offsetting these declines were increases of 458 tons of die castings, 431 tons of chemical residues, 346 tons of sal skimmings, 74 tons of rod and die scrap, and 34 tons of engravers' plates.

Zinc recovered in redistilled slab, the largest secondary product, was 5203 tons in April, a decrease of 5 per cent from March. Recovery of redistilled slab zinc has been generally increasing since the beginning of this series of monthly reports in January, 1944, when the quantity of this item recovered totaled 3309 tons. Only twice in the intervening period (in December, 1947, and March, 1948) has the recovery exceeded 5000 tons. Zinc dust production declined 307 tons in April. Output of remelt spelter, zinc chloride, and lithopone also declined. Increases of varying magnitude in production of remelt die-cast slab, zinc oxide, zinc ammonium chloride, and zinc sulfate were recorded in April.

Silver — Prices continued to fluctuate last week, the official market here closing at around 73.25c per troy ounce.

Magnesite — Output of crude magnesite in 1947 totaled 375,993 short tons, according to reports of producers to the Bureau of Mines. This production was unusually high for a peacetime year, being more than double the 1937-1939 average of 166,000 tons. Caustic-calcined magnesia declined 27 per cent from 1946 whereas refractory magnesia established a new high of 314,921 tons, 4 per cent over the previous record made in 1943.

Expansion Falls at Cost Hurdle

HIGH building costs are beginning to put a damper on industrial construction in California. Although expansion projects remain at a high level compared with prewar trends, the volume would probably be much higher, possibly double the present rate, if costs were lower.

West Coast contractors report that most big jobs now are for municipalities and institutions, while heavy industrial contracts for private firms are drying up. Many companies are altering piecemeal as needed or buying older buildings although they had first planned to build. One textile manufacturer, for example, bought an older structure because it would have cost five times as much to build a new one of comparable size. Another company did build, at a cost of 20 per cent more than when the facility was blueprinted a year ago, and even then all non-essentials had been trimmed. Another firm, which would be doing twice as much building if costs were lower, also is sacrificing quality by putting up structures made of cheaper materials than would have been used normally. Although it is saving $3 a square foot by such economies, the company still pays two and a half times more than prewar.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 23.50c, Conn. Valley; Lake, 23.62½ Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 22.00c; 88-10-2 (No. 215) 31.00c; 80-10-10 (No. 305) 27.25c; No. 1 yellow (No. 405) 17.50c.

Zinc: Prime western 15.00c, brass special 15.25c, intermediate 15.50c, East St. Louis; high grade 16.00c, delivered.

Lead: Common 19.30-19.35c chemical and corroding 19.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 15.00-16.00c, pigs 13.50-15.00c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type) 24.00-24.75c; No. 12 foundry alloy (No. 2 grade) 23.50-24.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.25-25.75c; grade 2, 24.50-25.00c; grade 3, 24.00-24.75c; grade 4, 23.50-24.25c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 35.00c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 35.50c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; shot nom.; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $75-$77 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.90, del.; special or patented shapes, $2.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 72.75c per ounce.

Platinum: $93-$96 per ounce.

Palladium: $24 per troy ounce.

Iridium: $110-$120 per troy ounce.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, fob mill)

Sheet: Copper 37.18; yellow brass 33.75; commercial bronze, 95%, 37.11; 90%, 36.63; red brass, 85%, 35.64; 80%, 35.16; best quality 34.63; nickel silver, 18%, 46.41; phosphor-bronze, grade A, 5%, 56.05.

Rods: Copper, hot rolled 33.03; cold drawn 34.28; yellow brass, free cutting, 33.44; commercial bronze, 95% 36.80; 90% 36.32; red brass, 85% 35.33; 80% 34.85.

Seamless Tubing: Copper 37.22; yellow brass 36.76; commercial bronze 90% 39.29; red brass 85% 38.55; 80% 38.07.

Wire: Yellow brass 34.04; commercial bronze, 95% 37.40; 90% 36.92; red brass, 85% 35.93, 80% 35.45; best quality brass 34.92.

Copper Wire: Bare, soft, fob eastern mills, c.l. 29.42½c, l.c.l. 29.92½-30.05c; weatherproof, fob eastern mills, c.l. 29.60-29.85c, l.c.l. 30.35c; magnet, delivered, c.l. 32.75-33.50c, 15,000 lb or more 33.00-33.75c, l.c.l. 33.50-34.25c.

ALUMINUM

Sheets and Circles: 2c and 3c mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	25.9	...	...
0.135-0.096	12-48	26.4	...	...
0.095-0.077	12-48	26.9	25.0	28.6
0.076-0.068	12-48	27.5	25.2	28.8
0.067-0.061	12-48	27.5	25.2	28.8
0.060-0.048	12-48	27.7	25.4	29.1
0.047-0.043	12-48	28.1	25.6	29.4
0.042-0.038	12-48	28.1	25.6	29.4
0.037-0.030	12-48	28.5	26.0	29.9
0.029-0.024	12-48	28.9	26.3	30.3
0.023-0.019	12-36	29.5	26.7	30.8
0.018-0.017	12-36	30.1	27.3	31.6
0.016-0.015	12-36	30.8	27.9	32.5
0.014	12-24	31.7	28.7	33.6
0.013-0.012	12-24	32.6	29.4	34.5
0.011	12-24	33.6	30.3	35.7
0.010-0.0095	12-24	34.6	31.3	37.0
0.009-0.0085	12-20	35.8	32.4	38.5
0.008-0.0075	12.20	37.1	33.6	40.1
0.007	12-18	38.5	34.9	41.9
0.006	12-18	40.0	36.2	46.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T	17S-T	—Hexagonal— R317-T	17S-T
0.125	45.0	47.0	...	...
0.156-0.203	38.5	40.0	...	...
0.219-0.313	35.5	37.0	...	...
0.344	34.0	36.00	...	...
0.375	33.0	35.5	42.5	43.0
0.406	33.0	35.5	...	...
0.438	33.0	35.5	42.5	43.0
0.469	33.0	35.5	...	...
0.500	33.0	35.5	42.5	43.0
0.531	33.0	35.5	...	...
0.563	33.0	35.5	40.5	40.5
0.594	33.0	34.5	...	...
0.625	33.0	35.5	40.5	40.5
0.656	33.0	35.5	...	...
0.688	33.0	35.5	40.5	40.5
0.750-1.000	32.0	34.5	37.0	38.0
1.063	32.0	34.5	35.5	36.5
1.125-1.500	31.0	33.5	35.5	36.5
1.563	31.0	33.5	...	35.5
1.625	30.0	32.5	34.5	35.5
1.688-2.000	30.0	32.5	...	...
2.125-2.500	29.5	31.5	...	...
2.625-3.375	28.5	30.5	...	...

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh)

Sheets: Full rolls, 140 sq ft or more, $23.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. Pipe: Full coils, $22.50 per cwt; cut coils, $22.75. Traps and Bends: List price plus 70%.

ZINC

Sheets, 19.50-20.00c, fob mill, 36.00 lb and over. Ribbon zinc in coils, 18.25c-19.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 17.25c; over 12-in., 18.25c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes,45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb. 35.00-36.00c.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
July Avg.	21.574	17.621	12.444	103.00	15.500	35.000	35.833	74.625
Aug. 2-9	21.50-23.50	19.30-19.350	15.000	103.00	15.00-16.000	35.000	40.000	74.625
Aug. 11-12	23.50	19.30-19.350	15.000	103.00	15.00-16.000	35.000	40.000	74.625
Aug. 13-14	23.50	19.30-19.350	15.000	103.00	15.00-16.000	35.000	40.000	72.750
Aug. 16	23.50	19.30-19.350	15.000	103.00	15.00-16.000	35.000	40.000	73.250
Aug. 17-18	23.50	19.30-19.350	15.000	103.00	15.00-16.000	35.000	40.000	73.750
Aug. 19	23.50	19.30-19.350	15.000	103.00	15.00-16.000	35.000	40.000	73.250
Aug. 20-25	23.50	19.30-19.350	15.000	103.00	15.00-16.000	35.000	40.000	72.750
Aug. 26	23.50	19.30-19.350	15.000	103.00	15.00-16.000	35.000	40.000	73.250

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 33.84c; oval 33.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 46.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 100 lb, 64.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 26.50c; 275-lb, or 500-lb bbl, 24.50c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb. 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c, fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 39.25c, fob Cleveland; 39.00c, Detroit; 38.00c, fob Philadelphia.

Stannous Sulphate: Less than 2000 lb, in 100 lb kegs, 100.00c, in 400 lb bbl. 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 23.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.125	21.125	20.375
Yellow brass	18.000	17.750	17.125
Commercial Bronze			
95%	20.125	19.875	19.375
90%	19.750	19.500	19.000
Red brass			
85%	19.750	19.500	19.000
80%	19.500	19.250	18.750
Best Quality (71-79%)	19.000	18.750	18.250
Muntz Metal	17.250	17.000	16.500
Nickel, silver, 10%	19.625	19.375	9.813
Phos. bronze, A.	22.625	22.375	21.375
Naval brass	17.750	17.500	17.000
Manganese bronze	17.750	17.500	16.875

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 19.50, No. 2 copper 18.50, light copper 17.50, composition red brass 16.50, auto radiators 13.75, heavy yellow brass 11.87½, brass pipe, 13.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 20.25-20.50, No. 2 copper 19.25, light copper, 18.25, refinery brass (60% copper), per dry copper content 18.00-18.25.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 17.75-18.00, No. 2 16.75-17.00, light copper 15.75-16.00, No. 1 composition red brass 13.75-14.00, No. 1 composition turnings 13.25-13.50, mixed brass turnings 8.00-8.25, new brass clippings 15.00-15.50, No. 1 brass rod turnings 12.00-12.50, light brass 7.50-8.00, heavy yellow brass 9.75-10.00, new brass rod ends 12.50-13.00, auto radiators, unsweated 11.50-12.00 cocks and faucets 11.25-11.75, brass pipe 11.00-11.50.

Lead: Heavy 17.00-17.50, battery plates 11.50, linotype and stereotype 18.00-18.50, electrotype 16.50-17.00, mixed babbitt 15.75-16.25, solder joints, 19.75-20.25.

Zinc: Old zinc 7.75-8.25, new die cast scrap 6.25-6.75, old die cast scrap 4.00-4.50.

Tin: No. 1 pewter 65.00-67.00, block tin pipe 83.00-84.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

Aluminum: Clippings 2S 12.00-12.50, old sheets 10.00-10.50, crankcase 10.00-10.50, borings and turnings 5.50-6.00, pistons, free of struts, 10.00-10.50.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00*
No. 1 Busheling	42.50-43.00*
Nos. 1, 2 & 3 Bundles	42.50-43.00
Machine Shop Turnings	37.50-38.00
Mixed Borings, Turnings	38.00-38.50
Short Shovel Turnings.	39.50-40.00
Cast Iron Borings	38.50-39.00
Bar Crops and Plate	49.00-49.50
Low Phos. Steel	49.00-49.50
Heavy Turnings	39.50-40.00

Cast Iron Grades

No. 1 Cupola	65.00-66.00
Machinery Cast	72.00-73.00
Charging Box Cast	59.00-60.00
Heavy Breakable Cast.	57.00-58.00
Malleable	69.00-70.00
Brake Shoe	55.50-56.00
Clean Auto Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.50-44.00
R.R. Malleable	75.00-80.00
Axles	55.00-56.00
Rails, Rerolling	58.00-59.00
Rails, Random Lengths	54.00-56.00
Rails, 3 ft and under	61.00-62.00
Rails, 18 in. and under	62.00-63.00
Railroad Specialties	60.00-60.50
Uncut Tires	54.50-55.00
Angles, Splice Bars	53.00-54.00

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$42.00-42.50*
No. 2 Heavy Melt. Steel	42.00-42.50*
No. 1 Busheling	42.00-42.50*
Nos. 1 & 2 Bundles	42.00-42.50*
Machine Shop Turnings	37.00-37.50
Mixed Borings, Turnings	36.50-38.50
Short Shovel Turnings.	38.00-38.50
Cast Iron Borings	38.00-38.50
Bar Crops and Plate	47.00-47.50
Punchings & Plate Scrap	47.00-47.50
Heavy Turnings	42.00-43.00
Alloy Free Turnings	40.00-41.00
Cut Structurals	48.50-51.50

Cast Iron Grades

No. 1 Cupola	69.00-71.00
Charging Box Cast	58.00-60.00
Stove Plate	58.00-60.00
Heavy Breakable Cast.	54.00-56.00
Unstripped Motor Blocks	58.00-60.00
Malleable	78.00-80.00
Brake Shoes	52.00-53.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*
R.R. Malleable	78.00-80.00
Rails, Rerolling	60.00-66.00
Rails, Random Lengths	58.00-59.00
Rails, 3 ft and under	63.00-64.00
Cast Steel	56.00-58.00
Railroad Specialties	58.00-59.00
Uncut Tires	55.00-56.00
Angles, Splice Bars	61.00-62.00

* Plus applicable freight springboard.

VALLEY

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00
No. 1 Bundles	42.50-43.00
Machine Shop Turnings	37.00-39.00
Short Shovel Turnings.	39.00-39.50
Cast Iron Borings	38.50-39.00
Low Phos.	48.50-50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$37.50-38.00
Short Shovel Turnings.	39.50-40.00

CINCINNATI

No. 1 Heavy Melt. Steel	$42.00
No. 2 Heavy Melt. Steel	42.00
No. 1 Busheling	42.00
Nos. 1 & 2 Bundles	42.00
Machine Shop Turnings	36.00
Mixed Borings, Turnings	36.00
Short Shovel Turnings.	38.00
Cast Iron Borings	37.00

Cast Iron Grades

No. 1 Cupola Cast	57.00
Charging Box Cast	45.00
Heavy Breakable Cast.	56.00
Stove Plate	50.00
Unstripped Motor Blocks	50.00
Brake Shoes	48.00
Clean Auto Cast	57.00
Drop Broken Cast	65.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00
R.R. Malleable	70.00
Rails, Rerolling	55.00
Rails, Random Lengths	54.00
Rails, 18 in. and under	61.00

DETROIT

(Brokers' buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$37.50-38.00
No. 1 Busheling	37.50-38.00
Nos. 1 & 2 Bundles	37.50-38.00
No. 3 Bundles	37.50-38.00
Machine Shop Turning	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings.	32.50-33.00
Cast Iron Borings	32.50-33.00
Punchings & Plate Scrap	42.50-43.00

Cast Iron Grades

No. 1 Cupola Cast	53.00-58.00
Heavy Breakable Cast.	47.00-52.00
Clean Auto Cast	53.00-58.00

BUFFALO

No. 1 Heavy Melt. Steel	$47.00-48.00
No. 2 Heavy Melt. Steel	41.75-42.25
No. 1 Busheling	41.75-42.25
No. 1 & 2 Bundles	41.75-42.25
Machine Shop Turnings	36.75-37.25
Mixed Borings, Turnings	36.75-37.25
Cast Iron Borings	37.75-38.25
Short Shovel Turnings.	38.75-39.25
Low Phos.	46.00-47.00

Cast Iron Grades

No. 1 Cupola	69.00-70.00
Mixed Cupola	63.50-64.00
Heavy Breakable Cast.	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under.	60.00-61.00
Railroad Specialties	55.00-56.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$45.00-46.00
No. 2 Heavy Melt. Steel	41.50
No. 1 Busheling	41.50
Nos. 1 & 2 Bundles	41.50
No. 3 Bundles	39.50
Machine Shop Turnings	37.50
Mixed Borings, Turnings	37.50
Short Shovel Turnings.	38.50
Bar Crop and Plate	50.00-51.00
Punchings & Plate Scrap	50.00-51.00
Cut Structurals	48.50-49.00
Elec. Furnace Bundles	46.00-47.00
Heavy Turnings	44.50-45.00
No. 1 Chemical Borings	42.00-43.00

Cast Iron Grades

No. 1 Cupola Cast	63.00-65.00
No. 1 Machinery Cast.	67.00-68.00
Charging Box Cast	62.00
Heavy Breakable Cast.	62.00-63.00
Unstripped Motor Blocks	59.50
Malleable	76.00-78.00
Clean Auto Cast	64.00-65.00
No. 1 Wheels	68.00-70.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$39.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Machine Shop Turnings	30.50-31.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings.	32.50-33.00
Punchings & Plate Scrap	42.00-42.50
Cut Structurals	42.00-42.50
Elec. Furnace Bundles.	42.00-42.50

Cast Iron Grades

No. 1 Cupola Cast	57.00-58.00
Charging Box Cast	56.00-57.00
Heavy Breakable	56.00-57.00
Unstripped Motor Blocks	52.50-53.50
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$34.40-36.40
No. 2 Heavy Melt. Steel	34.40
No. 1 Bundles	34.40
No. 1 Busheling	34.40
Machine Shop Turnings	29.40
Mixed Borings, Turnings	29.40
Short Shovel Turnings	31.40
Bar Crops and Plate	39.00-40.00
Punchings & Plate Scrap	39.00-40.00
Chemical Borings	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	62.00-64.00
Heavy Breakable Cast	53.00-55.00
Stove Plate	52.00-54.00
Unstripped Motor Blocks	46.00-48.00
Clean Auto Cast	54.00-56.00

CHICAGO

No. 1 Heavy Melt. Steel	$41.50-42.00
No. 2 Heavy Melt. Steel	41.50-42.00
No. 1 Bundles	41.50-42.00
No. 2 Bundles	41.50-42.00
No. 3 Bundles	39.50-40.00
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings.	39.50-40.00
Cast Iron Borings	39.00-39.50
Bar Crops and Plate	47.00-48.00
Punchings	48.00-49.00
Elec. Furnace Bundles.	42.50-43.00
Heavy Turnings	41.00-41.50
Cut Structurals	46.50-47.00

Cast Iron Grades

No. 1 Cupola Cast	71.00-72.00
Clean Auto Cast	71.00-72.00
No. 1 Wheels	64.00-65.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	47.00-48.00
Malleable	80.00-81.00
Rails, Rerolling	64.00-65.00
Rails, Random Lengths	58.00-59.00
Rails, 3 ft and under	61.00-62.00
Rails, 18 in. and under	63.00-64.00
Railroad Specialties	57.00-58.00
Angles, Splice Bars	59.00-60.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$44.00-45.00
No. 2 Heavy Melt. Steel	40.00-41.00
Machine Shop Turnings	35.00-36.00
Short Shovel Turnings	36.50-37.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-67.00
Mixed Cast	56.00-58 00
Heavy Breakable Cast.	59.00-60.00
Brake Shoes	60.00-61.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R. R. Malleable	71.00-72.00
Rails, Rerolling	63.00-65.00
Rails, Random Lengths	56.00-59.00
Rails, 3 ft. and under	60.00-61.00
Uncut Tires	51.00-52.00
Angles, Splice Bars	54.00-56.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.00
No. 3 Bundles	37.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	49.00
Cut Structurals	48.50

Cast Iron Grades

No. 1 Cupola Cast	63.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Lengths	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*27.50
No. 2 Heavy Melt Steel	*27.50
No. 1 Busheling	*27.50
Nos. 1 & 2 Bundles	*27.50
No. 3 Bundles	*24.50
Machine Shop Turnings	*18.00
Bar Crops and Plate	*27.50
Cast Steel	*27.50
Alloy Free Turnings	*18.00
Cut Structurals	*27.50

Railroad Scrap

No. 1 Heavy Melting	*28.50
Axles	*34.00
Rails, Random Lengths	*29.00

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	26.00
No. 1 Busheling	26.00
Nos. 1 & 2 Bundles	22.00-23.00
No. 3 Bundles	22.00-23.00
Machine Shop Turnings	19.00-21.00
Mixed Borings, Turnings	19.00-21.00
Punchings & Plate Scrap	26.00-28.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	40.00-42.00
Heavy Breakable Cast.	35.00
Stove Plate	30.00
Unstripped Motor Blocks	32.50
Malleable	40.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	35.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	$27.50
No. 2 Heavy Melt. Steel	27.50
Nos. 1 & 2 Bundles	27.50
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchinge & Plate Scrap	28.00
Elec. Furnace Bundles.	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	42.00-48.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

For High Density Bales...use the Self-Contained

LOGEMANN Scrap Presses

Press, Pump, Tank . . . all in one compact assembly

Available with Automatic Control

Both two and three ram models are available with automatic controls . . . and are recommended when the nature of the scrap warrants such application and where high output is desired.

You conserve floor space and piping in plants and mills where space is limited . . . and at the same time, handle high tonnages at extremely low operating cost.

Pioneers in the metal baling field, LOGEMANN engineers have embodied the features proved through actual operation to be essential to constant, uninterrupted service. These same engineers are prepared to offer suggestions as to operating layout and installation of any unusual or specific need. Present your problem to them, stating the nature of your scrap and the tonnage desired. There is no obligation.

LOGEMANN BROTHERS CO.

3164 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

● This compact, self-contained unit meets the demand for high-density bricks of limited weight as used in certain furnaces.

Sheets, Strip . . .

Many buyers of stainless shift to new sources of supply due to wide price spreads

Sheet Prices, Page 96

Philadelphia — While concern over higher and varying prices for carbon sheets and strip is submerged currently to that of availability of steel, cost ranges involved in price structure for stainless, notably popular 18-8 grades, are spread so widely there are cancellations and shifts to new sources of supply. As a result of different individual action on stainless prices, there are spreads of upwards to $50 a ton under present price lists. While these grades are tightening in supply, they have not reached the point where this spread in cost to consumers can be ignored.

All mills have not followed the 10 per cent increase across the board on this grade. Other producers, while advancing in line on straight chromium and other grades, made only a slight increase in 18-8, most widely used, which gives a spread on some grades of upwards of 3.50 cents per pound. This spread in costs has purchasing men sharpening pencils.

Impact of price discrepancies has resulted in at least three mills revising prices on stainless to meet competition at the lower levels, although small details are not uniform in even these cases.

Situation in stainless steel is also confused by revisions in discounts to distributors, while one producer has withdrawn on No. 24 and 26 gages.

Where carbon sheet allocations have been made for fourth quarter, there are sharp reductions in quotas, notably in hot-rolled, and several mills are offering none for the period, or at least a minimum tonnage. Those scheduling on a monthly basis, and this includes more sellers than usual, are carving out large slices of October production to take care of carryovers. Delinquent deliveries are general on carbon stock. Delay in setting up quotas for late months in fourth quarter is due to uncertainty as to how much tonnage will be drained off by voluntary allocation programs.

New York — Mills allocating carbon steel on a monthly basis have scheduled for November. More producers will have no hot-rolled sheets against new volume for October as that month will go heavily toward carryovers; November will bring some improvement in paper tonnage, but the actual volume likely to be shipped consumers will be about the same in both months. Heavier voluntary allocations are also reflected for fourth quarter and overall tonnage from carryovers and new voluntary allocated volume means a 10 per cent reduction in some instances. While some hard consumer goods, manufactured largely from sheets and strip, are reported to be backing up in supply pipelines, this is not showing up at the steel mill level. Effect of the f.o.b. mill pricing system is delayed by the current excess demand for steel, yet, including mill price advances and payment of freight costs, consumers are paying up to $15 delivered a ton and more than earlier on some grades out of Pittsburgh and other areas taking the same freight. Under the present quotas, many could not change supply sources to nearer mills, if they desired, as these producers at the moment are not in a position to take on additional volume.

Boston — Only in alloy grades are cold strip mills getting hot-rolled in sufficient diversified volume to meet scheduled commitments; high carbon grades are about as difficult to obtain as low-carbon grades. Mills issuing allocations on hot-rolled are holding to recent levels in volume, but lag frequently on delivery. Placement of orders in excess of quotas is impossible. Demand for narrow cold-rolled strip is holding at the mill levels, although pressure is less strong for steel in some directions. Nevertheless, users are generally taking full allocations, but in a few instances may be building inventories slightly. Prices are mixed with at least two on the old basing point system with others selling f.o.b. mill at varying quotations and differentials.

Pittsburgh — Due to the uncertainty as to the amount of steel requirements under the voluntary allocation programs, some producers are scheduling ahead only for the month of October. Other interests have not yet crystallized their rolling schedules for fourth quarter. However, it appears probable that a reduction of 5 to 10 per cent in mill allotments for fourth quarter will be put into effect for steel consumers not coming within the scope of voluntary allocation programs. One large producer plans to blow out one of its blast furnaces early in September for enlarging and complete relining. This relining program will require three months and therefore will further affect the company's monthly steel allocations to its customers. No noticeable change in the pattern of sheet and strip distribution by rail, truck, or barge has yet developed. As long as present tight supply situation exists, most metalworking companies will be more concerned with obtaining necessary steel supplies as quickly as possible rather than by barge.

Cincinnati—Nature of inquires, to sheet mills, reegarding tonnage for fourth quarter discloses anxiety over the supply situation after full impact from the voluntary allocations. Despite close calculations, there will be some carryover into fourth quarter and it is possible the usual quotas, as established earlier this year, may be trimmed. So far district mills have done only preliminary work on fourth quarter schedules.

St. Louis — Prospects are improving that sheet steel consumers in this area will not suffer greatly under the voluntary allocations program. A check of customers of Granite City Steel Co., the district's principal sheet producer, shows virtually all will be able to obtain certification for the tonnage they already have on Granite City's books. Formerly it appeared the approximate 10 per cent nick the program will put in the company's total tonnage would fall heavily on a few buyers classed as nonessential. Much of the sheet business already booked is for heating and atomic equipment and barges, in which the allocations scheme will involve only a bookkeeping shift.

Sheet production is improving following a July setback. Granite City's July shipments dropped to 30,000 tons from 37,000 tons in June. August's total now looks like 38,000 tons and the company expects 40,000 tons in October. Its 45,000 ton monthly capacity is expected to be reached after Jan. 1.

A gradual changeover from rail to water and truck transportation is beginning among sheet fabricators. Formerly 90 per cent of finished steel moved out of here by rail, and 5 per cent each by barge and truck. F.o.b. pricing promises to change the proportion radically. Consumers now are calculating the savings by water. One large buyer in New Orleans is purchasing two barges to handle his shipments.

Stainless-Clad Steel Prices

Pittsburgh—Jessop Steel Co. raised prices for all types of stainless clad plates and percentages 2½ cents per pound, effective Aug. 23. The new prices for a selected number of grades, based at Washington, Pa., and Claymont, Del., are as follows in cents per pound:

	—10%—		—20%—	
Grade	New	Old	New	Old
304	22.50	20.00	26.50	24.00
310	32.50	30.00	36.50	34.00
316	27.00	24.50	31.00	28.50
321	23.50	21.00	27.50	25.00
347	25.00	22.50	29.00	26.50
405	20.50	18.00	24.50	22.00
410	20.50	18.00	24.50	22.00
430	21.00	18.50	25.00	22.50

Company's revision of extras applicable to stainless clad plates are identical to those put into effect by Lukens Steel Co. (STEEL, Aug. 23, p.130).

Jessop also has established the following new prices on stainless clad sheets, based Washington, Pa., and Conshohocken, Pa.:

(cents per pound)

	—10%—		—20%—	
Grade	New	Old	New	Old
302	19.75	19.50	21.50	21
304	20.75	20.50	22.50	22
316	26.00	25.50	28.00	27
347	24.00	23.50	26.00	25

Revisions in sheet extras, in cents per pound, are as follows: One cent gage extra is charged for 14, 15 and 16 gage, against ½-cent previously; for 17 and 18 gage, 2 cents is now charged against 1 cent formerly; for 19 and 20 gage, 3 cents compared with 2 cents. High tensile steel backing extra is 1½ cents, against 1 cent formerly. Backing extra for deep drawing stock base is the same. Length and width extras have not been changed, while quality extras were revised in line with schedule previously announced by Carnegie and Jessop on solid stainless steel. Polishing extras on No. 4 finish have similarly been revised.

Jessop's stainless sheet prices are retroactive to Aug. 10, announcement having been delayed pending determination of price bases.

Pittsburgh — Crucible Steel Co. of America has followed Carnegie-Illinois Steel Corp.'s price pattern covering stainless products, with a few exceptions on special grades and special extras. Included in the price announcement to the trade were additional price revisions for those products produced by Crucible but not produced by Carnegie.

LINK-BELT makes more and better sprockets

with **J&L JALCASE STEEL**

J&L STEEL

More parts per hour . . . Better satisfied machine-tool operators with this original, free-machining, open-hearth steel

Link-Belt men like J&L Jalcase steel because it machines freely at high speeds, is easy to heat treat and the parts have a fine finish. They get more pieces per hour because Jalcase is uniform.

Their machinists particularly like Jalcase. They get higher production because of easier machinability, faster operation and extra long tool service.

Link-Belt is the world's largest manufacturer of conveyor and power transmission equipment—and a large producer of sprockets and chains used throughout all industry. Jalcase, because of its unique combination of free-machining and heat-treating properties, helps Link-Belt overcome the ever-increasing cost of production. This means:

- **Lower unit cost**
- **Finer finish on completed parts**
- **Higher physical properties**
- **Longer tool life**
- **Less down-time**
- **Less wear on machine tools**

We should like to tell you more about JALCASE—the *original*, open hearth, free-machining steel. The coupon below is for your convenience.

Jones & Laughlin Steel Corporation
404 Jones & Laughlin Building
Pittsburgh 30, Pennsylvania

Please send me complete data on JALCASE—the *original*, open hearth, free-machining steel.

Name_____

Title_____

Address_____

City_____ State_____

JONES & LAUGHLIN STEEL CORPORATION

Tin Plate . . .

Distribution pattern for tin plate is generally unchanged despite increased cost

Tin Plate Prices, Page 97

Pittsburgh — Little change has yet occurred in the pattern of tin plate shipments despite increased cost to consumers because of current industry practice of pricing product at the mill. Most sellers have received a number of inquiries concerning freight rates to various destinations via barge, truck, or combination of rail, barge and truck. Bulk of shipments, however, continues via rail. The present freight advantage on truck shipments will be narrowed on basis of an approximate 15 per cent increase being sought by trucking firms.

It is pointed out that tin plate consumers in Baltimore must pay 47 cents per 100 pounds rail freight charges on delivery from Pittsburgh mills. The truck rate to same destination is 42 cents. On shipments into Brooklyn, N. Y., from Pittsburgh, the rail rate is 56 cents, with little or no freight advantage on truck shipments. Considerable tonnage of tin plate is moved by barge from Pittsburgh mills to Cincinnati district on basis of about 17 cents per 100 pounds, in contrast to 46-cent rail rate. Percentage increases in rail rates over the past two years have placed mills in the Pittsburgh-Wheeling-Weirton district at an increased freight disadvantage on shipments into the East.

Establishment of a $7.55 per base box price on 1.50-pound coating for coke tin plate at the Pittsburg, Calif., plant of Columbia Steel Co. makes it possible for consumers of tin plate in San Francisco to obtain this item cheaper than the delivered price out of Bethlehem Steel Corp.'s Sparrows Point plant. On shipment out of Sparrows Point the following charges in cents per base box must be added to the $6.90 per base box price on hot dipped quoted by Bethlehem: 0.044 switching at Sparrows Point; 0.65 ocean rate; 0.015 insurance; 0.0175 wharfage; 0.024 carloading; and 0.0275 for switching at San Francisco. This makes a total transportation charge of 0.778 cent, or a delivered price of $7.678 per base box at San Francisco, excluding 3 per cent tax and 3-pound per base package tare. Freight on black plate from Sparrows Point is 0.858 cent on same basis. For delivery into San Francisco from Columbia Steel Co.'s Pittsburg works, there is a charge of 8 cents per 100 pounds, bringing the price to $7.63. On all-rail shipments from Pittsburg, a freight charge of $1.03 must be added to the $6.80 per base box price, resulting in price delivered San Francisco of $7.83 per base box.

Tubular Goods . . .

Tubular Goods Prices, Page 97

Seattle — Cast iron pipe market is inactive, no major projects being up for bids. Agencies have practically no inventories and no prospects of improved deliveries in the near future. Many projects have been postponed because pipe cannot be on the job in less than 24 months; in some instances other types have been purchased. Such action was taken at Raymond, Wash., which called bids for 100 tons cast iron.

Plates . . .

Plate Prices, Page 97

Boston—Bulk of light gage carbon plate tonnage in this area is supplied by two producers with most other mills generally selective in acceptance of orders. Integrated shipbuilding requirements, starting in fourth quarter, likely to effect overall tonnage available from one unit and the tonnage of carbon plates based at Sparrows Point and Buffalo is already narrowing. There is as yet no decline in plate tonnage out of Pittsburgh and other centers still shipping at the 67-cent freight rate. More volume would go to those mills if there were openings.

Philadelphia—With few exceptions plate tonnage has not been allocated beyond October. Where quotas for full period have been tentatively scheduled, fabricators have been advised that further demands for specific voluntary distribution will come out. Earmarked tonnage amounts to one-third of plate output in some cases and of the 475,000 tons now tied into voluntary distribution ratio of plates is high. Shipbuilding requirements, starting in October, will be mounting, not only for tanker construction, but also for war craft and passenger-cargo ships. Three of the latter, 10,600 tons each, deadweight tonnage, will be constructed by New York Shipbuilding Corp., Camden, N. J. Tanker tonnage is under allocation and the 40,000 tons per month will be spread among entire group of plate mills, although bulk of ships will be constructed at Bethlehem Steel Co. yards. To allow for contingencies, most capacity for November-December is still held open.

Seattle—Plate fabricators are busy, although lack of materials is a major obstacle. There is a steady run of minor contracts involving small tonnages.

Warehouse . . .

Warehouse Prices, Page 99

New York — No improvement in carbon steel tonnage for fourth quarter distribution from warehouse is indicated by the limited number of mill allocations coming through: quotas in many cases are lower. Alloy products are also tightening, but with inventories in better balance than in carbon items. Tool steel generally balances demand. Buying of steel from warehouses continues heavy; what slackening is noted for some products develops from seasonal vacations, now drawing to a close, with most consumers. Prices vary among distributors, depending on sources of supply, although for most products differences are not great.

Boston—One factor contributing to spreads in warehouse prices centers in the inability of some distributors to get on the books of nearby mills; allocation has been established with producers at some distance and nearby or the nearest mills have no openings in many products for new quota accounts. Hot-rolled alloy bars 4140 grade, for instance, carries a spread, 8.24c to 9.74c, Boston city district. Prices are, however, becoming better stabilized with more warehouses quoting same price for same product. At the moment price is secondary with steel availability the important issue; in this respect outlook for fourth quarter secondary distribution of carbon steel products is clouded by lower allocations for that period in most cases.

Philadelphia — Fourth quarter allocations to steel warehouses may range from 10 to 15 per cent overall with some products dipping as much as 20-25 per cent. Reductions are heaviest in carbon steel products for which demand is heaviest. Distributors thus are unable to fill but a fraction of demand. Plates, sheets, structurals and to lesser extent carbon bars are among tightest items. Alloys are tightening, but bulk of inquiry can be met. Tool steels occupy the same position.

Cincinnati — Steel warehouse stocks were lightened during August, sales exceeding mill receipts by many tons. Scarce items of steel move out as soon as received. A good part of demand is being fed from wasters.

Seattle — Jobbing houses state higher prices have not yet affected the volume of turnover, the immediate question being that of delivery. Wholesalers have no substantial inventories and find it difficult to cover their needs. Coast mills are booked to capacity and eastern producers have reduced allocations, principally on plates and wide flange beams. Sheets, pipe and nails continue critical.

Steel Bars . . .

Bar Prices, Page 96

Boston — Following much the same pattern, carbon steel allocations for fourth quarter fluctuate with the size of individual mill carryovers; these vary but inroads against backlogs this quarter will be disappointing in many instances. October will be especially meager for new volume and some mills are blanked out entirely for that month. Alloys are not generally allocated, but sellers are screening orders and accounts more stringently and current policy in accepting alloy orders amounts to allocation in fact. Alloys are tightening, but supplies are not as critical as those of carbon stock, notably hot-rolled.

Philadelphia — October carbon bar production will be devoted heavily to carryovers. Some mills are blanked out and others will have but 50 per cent capacity available for new volume that month. Schedules for last two months of fourth quarter may be subject to revision, depending on must allocations. At moment November-December quotas of carbon bars compare favorably with current quarter in volume. Reductions thus far apply largely against delinquent tonnage but some sniping at later scheduled tonnage is expected. Alloys are tightening and some mills have filled fourth quarter schedules, notably on open hearth output.

The Brooks Service

KEEPS
you out of trouble

instead of
GETTING
you out of trouble

Positively: This Brooks Service Kit *Keeps You Out of Trouble—Instead of Getting You Out of Trouble.*

Wherever LEADOLENE Fluid Lubricants are used in Circulating Systems these "easy-mailing kits" are supplied. At regular intervals, as frequently as the use of the equipment would justify, an adequate sample is drawn off and sent to our Cleveland laboratories where exhaustive tests are made. A thorough analysis is made as to viscosity, pH-ilm strength, water content and foreign matter. There is no charge made to our customers for this service. Should variance in the properties of the lubricant develop since the previous analysis, immediate corrective measures can be taken. These control measures are vital when many hundreds of gallons of costly lubricants can become contaminated—and require complete replacement. In fact in fifteen years not a single system *using Leadolene Fluid Circulating Oil* System Lubricants has required replacement. This is a record for which we are very proud.

*LEADOLENE *Fluid Lubricants*
FOR CIRCULATING OIL SYSTEMS

. . lubricates efficiently in the presence of water, and under normal operating temperatures drops the water, thus eliminating centrifuging and other costly methods. Neither will it lose its "Indestructible" pH-ilm strength during severe service. Leadolene will not deteriorate under agitation of constant service. When production is of paramount importance, delays and costs for replacement parts are major factors—let the Brooks Engineering Service work with you.

1934

For example: Back in 1934 Leadolene was introduced in the Circulating Oil System of a large Mid-Eastern steel plant. Other than an occasional make-up of the lubricant, in no case was a complete change ever made. Success of this first system in phenomenal results has been responsible for Leadolene being adopted in countless circulating oil systems of the steel industry.

*LEADOLENE . . . the *"I.P. Lubricant" (*Indestructible pH-ilm) . . . for Industrial Needs

The Brooks Oil Co.

Pittsburgh 12, Pennsylvania
Cleveland, Ohio
Hamilton, Ontario

***Warehouses:* In Principal Industrial Cities**

Structural Shapes . . .

Structural Shape Prices, Page 97

High costs hit construction projects, but structural demand is as tight as ever

Boston — Contracts canceled by discontinuance of the $80 million synthetic gasoline and chemical plant, Stanolind Oil & Gas Co., Garden City, Kan., include one with Stone & Webster Engineering Corp., but involves little or no steel already placed. In announcing temporary abandonment, the company announced costs had more than doubled over the original capital investment required for the project. This advance in costs is also reflected in a decline in estimates for private construction in New England. Active bridge tonnage is also lower, aggregating about 500 tons for small spans. Plain structural material for fabrication under allocation barely meets backlog tonnage on which shops are committed. For the second section of the East Boston express highway, 3500 tons remains to be placed.

New York — Structural inquiry for public works is well maintained, but more private construction is being held up because of rising costs. Slackening demand is not reflected at the mill level and plain material for fourth quarter will be lower. Fabricating shops complain of deliveries being behind schedule; shops with contracts covering public works, placed at firm prices, are considering application for voluntary distribution covering tonnage in this category.

Philadelphia — With slackening in inquiry for fabricated structural steel, outstanding new project bid is mill building for Alan Wood Steel Co., Conshohocken, Pa., for 30-inch strip mill bought from Jones & Laughlin Steel Corp., Otis Works. Fabricating shops and warehouses get moderate reductions in October quotas on structural shapes from one producer, that month being as far as has been ventured in fourth quarter scheduling. Another has posted October-November at about the same levels as corresponding months this quarter, with slight exceptions involving warehouses. Requirements for railroad freight car construction, which will top 10,000 units again this month, are holding through fourth quarter, but some easing beyond or within first half next year, may be conjectured. Should this develop, space would be largely taken up for ship construction and other distribution programs. This accounts for some unfilled schedules for last two months of year.

Seattle — Fabricating plants report the steel shortage increasingly acute, making it impossible to bid on many larger jobs. Allocations and deliveries are unsatisfactory and the pending maritime strike is causing further anxiety. Preference is given to minor projects, involving small tonnages within inventory limits.

Alaskan Building Boom Seen

Seattle — Indications point to extended activity in Alaska for the next two years. Col. L. H. Hewitt, U. S. Engineer in charge of the Seattle office, has stated that the proposed Alaska airfield construction program involves ten contracts totaling $65 million to be awarded within the next 18 months. Between September and next February bids will be requested for housing, barracks, warehouses and other facilities, the largest contract involving $10 million. The engineers will furnish necessary equipment and much material.

Details of the program were discussed here on Aug. 20 with interested contractors. Col. William E. Potter, Alaska district engineer, plans similar conferences in the near future at Kansas City, Chicago and New York. Engineers and specialized personnel will be interviewed

Other developments that are of interest to the far northern territory include plans for a $2½ million cement plant proposed for Windy near Anchorage, revealed by RFC officials. It is intended to obtain raw materials from the Mt. McKinley area. This industry, it is stated, would help to reduce construction costs in Alaska.

From Juneau comes announcement by Ben Mullen, vice president Alaska Industrial Corp., of plans for proposed $20 million mill to be located near Sitka for the production of rayon pulp. The plant's capacity is expected to be 200 tons daily.

Tool Steels . . .

Tool Steel Prices, Page 97

Pittsburgh — Tool steel producers are still quoting prices on a competitive basis. Firth Sterling Steel & Carbide Corp., McKeesport, Pa., last week announced a general 10 per cent price increase on tool steels, stainless steel and specialty stocks. The tool steel price action was effective as of July 28, and on stainless wire and bars the effective date was Aug. 9.

Wire . . .

Wire Prices, Page 97

Chicago — Demand for most wire products, manufacturers' as well as merchant, holds at a high level and is in excess of products. The nail situation holds unchanged with output far below requirements. Even industrial demand for nails holds strong. Likewise, requirements for mesh are very heavy. Contrarywise, inquiries for poultry netting and bale ties have eased considerably in this area.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 96

Pittsburgh — Rail steel concrete bar producers are quoting mill prices within range of $4.65 to $5.25 per 100 pounds. The entire price situation is in a constant state of flux, with many interests holding off publishing prices until this condition is stabilized. Rail steel concrete bar interests report very heavy demand, in some instances developing from governmental industrial plant projects. Unsatisfied demand for new billet concrete bars also is a factor in this connection.

Seattle — Rolling mills, operating at capacity and having large backlogs, are under strong pressure by contractors who are in desperate need of reinforcing bars and other items. Producers are trying to take care of regular customers, but the demand for small tonnages is abnormal.

Pig Iron . . .

Pig Iron Prices, Page 98

Protests mount over K-F leasing of blast furnace at Cleveland

Buffalo — If the Kaiser-Frazer leasing of the Cleveland blast furnace is upheld, it may be a devastating blow at approximately 25 foundries in this area. These foundries have been dependent on Republic Steel Corp., which has been operating the Cleveland furnace, for iron. Spokesmen for many of the foundries, who have joined those from other areas to block the WAA lease granted Kaiser, point out that if this source of pig iron is cut off it will mean either a sharp curtailment in operations or a complete shutdown.

President Keith Williams of the Pratt & Letchworth Co. Inc., said the leasing of the furnace "is bound to affect us seriously, even to the point of a complete shutdown." President Peter F. Rossman of the Symington-Gould Corp., wired the WAA that the firm's Depew plant will suffer as a result of the lease. He said that lease "will have a disastrous effect on our output of steel castings for the top priority freight car program." Works Manager Austin C. Ross of the Worthington Pump & Machinery Corp., said the plant "will have to cut its operations 50 per cent if it loses this source of supply for iron."

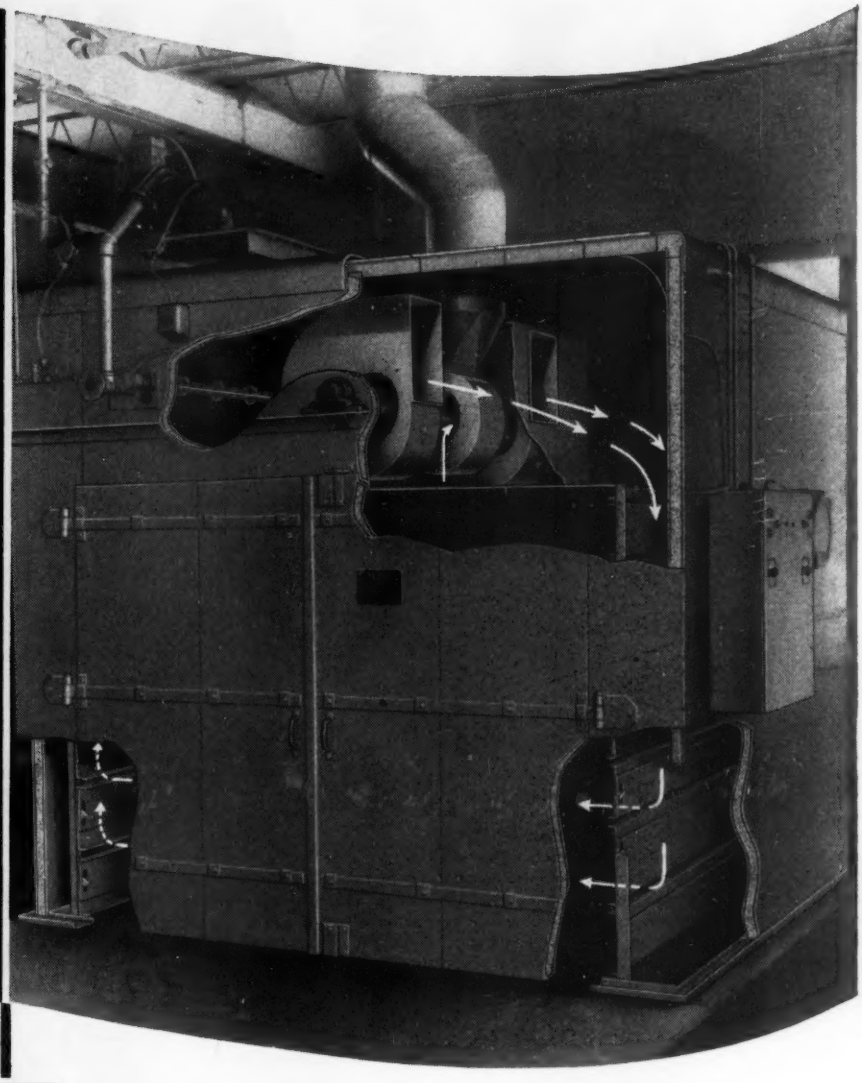
The Inter-Allied Foundries of New York State registered a strong protest of the leasing at a special hearing of the Senate Small Business Committee.

The tight supply situation continues in pig iron even though district operations have now reached 100 per cent with all sixteen of the area's stacks in action. Relighting of the second blast furnace at the Wickwire plant will help some. It is a 400-ton daily producer which means it will fall far short of filling the gap in this area that will be left if there is a drastic change in the distribution of pig iron as a result of the Kaiser lease.

Philadelphia — Merchant furnace at Swedeland, Pa., has reached capacity production and next month will meet current obligations, but there is no iron tonnage to fill gaps left by halting of Republic volume from Troy and Buffalo. In view of inability of other sources to supply this area because of the overall limitations, many melters are affected by the Republic stoppage, more than would normally be the case. Swedeland furnace is the standby for bulk of merchant volume although there is considerable Dutch and other foreign iron offered. At $85-90 a ton fair amount of this iron is being bought to cover emergency, but such prices are out for most smaller shops and jobbing foundries. High sulphur coke is production handicap hamper-

The Well Designed Industrial Oven

does a better job at less cost



This batch type oven used equally well for core, insulation, paint and grinding wheel baking—also low temperature heat treating, plastic curing and other processes, is a compact, self-contained unit. Recirculating heaters and exhaust fans are integral parts of the oven assembly for maximum heat conservation, greatest economy of plant space and better appearance. Note they are entirely within the oven frame.

Although gas heating is illustrated here, any other type of heating is equally applicable.

A single drive motor operates both recirculating and exhaust fans for maximum power saving.

A positive movement of heated air across the work space assures uniform baking temperatures throughout the entire load and maximum baking efficiency.

Field installation is greatly facilitated by the use of a completely wired operating control panel. All operating and control parts are readily accessible for inspection, service or adjustment.

• • • •

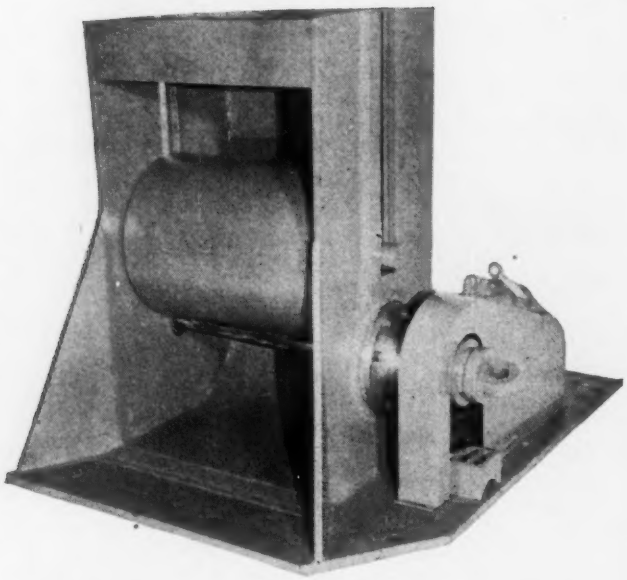
Consult a Young Brothers Engineer before deciding on any industrial oven equipment.

5099

Young Brothers Co.

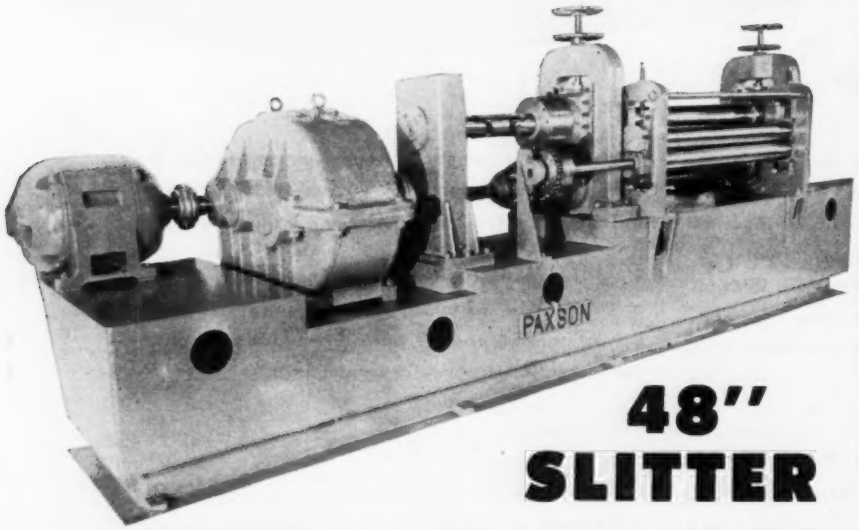
6503 MACK AVENUE • DETROIT 7, MICHIGAN

PAXSON



SCRAP BALLER

Here is a new design of an old tool. The steel scrap is fed into the machine and wound around a small driven arbor and at the same time is compressed by the floating roll. The bale of scrap, 18" x 24", then is removed by withdrawing the small arbor. The baller can be moved to any location in the plant where current is available and the design is such that the machine will not tip or slide on the floor. Motor, speed reducer and all electrical connections are included and delivery can be made in 60 to 90 days.



48" SLITTER

The Paxson 48" Slitter is designed for sheets and coils. Its maximum capacity is 11 cuts of 11 gage metal, 100' per minute when slitting sheets and 100'-800' per minute when slitting coils. The slitter is equipped with overriding clutches to allow free wheeling of the arbors when coils are being slit. Detachable pinch rolls are provided for use when slitting sheets.

We also manufacture coilers, levellers, pay off reels, edge rollers and the 84" Paxson slitter built for special requirements.

Write for complete information on any of this equipment.

PAXSON MACHINE CO.
SALEM, OHIO

ing iron output.

Chicago — Foundries in this area continue to lose ground, rather than gain it, in their efforts to obtain more adequate supply of pig iron. Heavy requirements of hot metal for steelmaking and bankings of blast furnaces for repairs have limited merchant iron tonnage. Suppliers have a tough task in equitably distributing their furnace quotas. Now consumers are uneasy lest Kaiser-Frazer acquisition of the Cleveland blast furnace upset the whole midwestern iron distribution pattern. Shops have gone about as far as they can in scrap utilization and this commodity is scarce and high priced. Of the district's 43 blast furnaces, 38 are active. Since early in August, Carnegie-Illinois Steel Corp. had taken off two of its stacks at the Gary steelworks. Following the July explosion at the company's South Works, iron output there has not come back to full level.

Cincinnati — Pig iron has been moving to melters this month in fair volume, but the tonnage is not quite equal to allotments from furnaces. Chief interest centered on announcement of the Kaiser leasing of the Cleveland furnace. Republic Steel Corp., the former operator of this furnace, has been supplying district foundries. No source of substitute supply is available in the current market. Full weight of the move, if a solution to the problem is not found, will hit the district melt soon after Sept. 1. Stocks are not laid down in tonnage to cushion the blow.

St. Louis — Principal effect of the pig iron shortage in this district is to aggravate the cast scrap scarcity and force scrap prices higher. Foundries complain of inability to get sufficient iron, but indications are they are suffering more from frustrated hopes to expand capacity than from actual production curtailment. Ninety per cent of pig in this district is supplied by Missouri-Illinois Furnaces Inc., which, until output was cut in half three weeks ago for repair of one stack, met demand rather well. Next month there may be some curtailments among foundries unable to stock iron in advance or obtain more from other sources. One is reported to have obtained some Belgian iron at $85, f.o.b. dock. Mo-Ill is scheduled to resume full 1000-ton daily operations by Oct. 1. Republic Steel Corp. does not ship any iron to this district. Principal suppliers of the 10 per cent of outside iron used here have been Sloss-Sheffield, Pickands Mather, Wisconsin Steel Co. and, before the war, Inland Steel Co.

Iron Ore . . .

Iron Ore Prices, Page 98

Cleveland — Shipments of Lake Superior iron ore during the week ended Aug. 23 totaled 2,540,259 tons compared with 2,599,638 tons during the preceding week and 2,769,658 tons during the like week a year ago, according to the Lake Superior Iron Ore Association, this city. This brought season's cumulative total to 51,244,678 tons, an increase of 3,551,465 tons over the total for the like period a year ago. Shipments from United States ports alone rose 3,968,078 tons over a year ago.

...bought by the Million

PICKLED AND OILED PLATE, SHEARED, DIE-CUT, EMBOSSED

Approximately two feet long and $\frac{3}{16}$-inch thick, these parts are produced from Lukens steel plate for a leading refrigerator manufacturer. Their shape is simple, but they illustrate a point.

You get steel plate parts that are ready for finishing when you buy from By-Products Steel Co.—flame-cut, sheared, pressed, blanked, bent or formed in any other manner. We have over 150 major machines for doing such work. Parts are cut from any thickness of plate and in the widest widths available anywhere.

Your facilities are freed for other fabrication work when By-Products Steel Co. does these initial operations. You get greater output without increasing your investment in plant equipment. In addition, the scrap produced in cutting out your shapes goes right back to Lukens open hearths where its value is highest. You pay freight only on the weight of the part you want, your scrap losses and handling charges are lower.

For a copy of Bulletin 270 showing the wide range of work we do, write By-Products Steel Co., Division of Lukens Steel Company, 414 Strode Avenue, Coatesville, Penna.

Visit us at the Shows!

Booths 9 and 10
The National Chemical Exposition
Chicago Coliseum
October 12 thru 16

☆

Booth 320
National Metal Exposition
Convention Hall, Philadelphia
October 25 thru 29

LUKENS
BY-PRODUCTS STEEL DIVISION

BY-PRODUCTS STEEL CO.

STEEL PLATE SHAPES . . . FLAME-CUT · BENT · SHEARED · PRESSED · BLANKED · WELDED

● Horsburgh & Scott spur gears are rugged and dependable, built for industry's hardest tasks . . . they stand supreme in quality of materials and workmanship. You'll find proof in their performance and long, uninterrupted service.

Send note on Company Letterhead for 488-Page Catalog 41

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

Scrap . . .

Scrap Prices, Page 102

Supply position of eastern mills improves on receipt of foreign tonnage

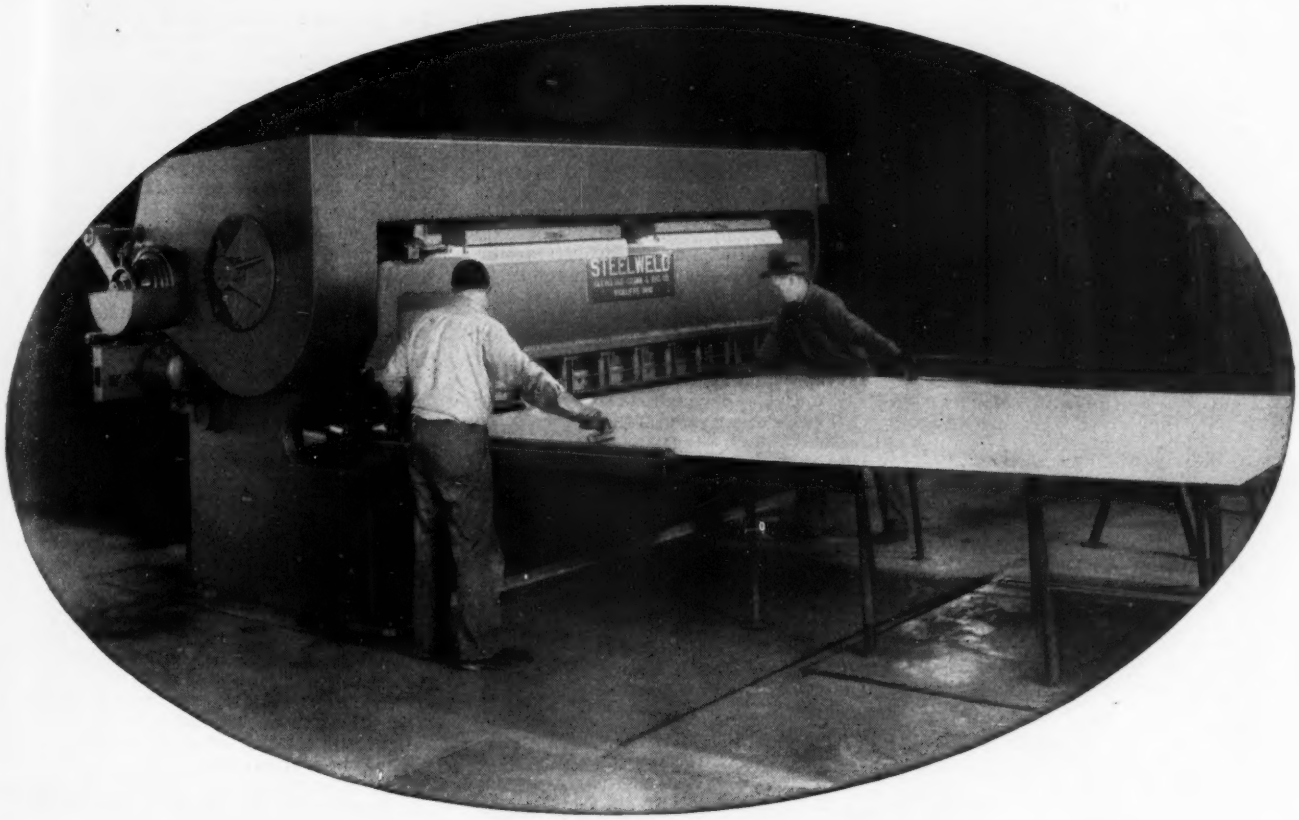
Pittsburgh — Flow of scrap to mill yards continues at a relatively high level with some interests reporting a moderate improvement in stocks despite continuation of steel production at practical capacity. An increasing tonnage of overseas scrap is scheduled for mills in this district while a substantial tonnage continues to move on a reciprocity basis to mill interests here. Steady buying of dealer scrap is noted, although tonnages involved are relatively small. Brokers and dealers are unwilling to make large tonnage commitments under present marketing conditions unless scrap is already on hand. One producer continues to keep in effect its suspension order on shipments of No. 2 bundles for the first time since the war. Railroad specialties are bringing more than $60 per gross ton. Cast scrap prices are well sustained at present levels, although a number of foundries currently are out of the market. Bulk of No. 1 heavy melting steel continues to move at low phos scrap prices.

Philadelphia — More steel mills are in better position on scrap inventory with incoming volume balancing melt and in some cases slightly heavier. Steel works cast reserves have improved and prices for those grades are easier. Otherwise prices are unchanged. Cast inventories with steel mills are moderately better off than heavy steel grades. Two cargoes of foreign scrap have arrived at Philadelphia and tonnage from abroad over next few months will be substantial at Baltimore, Philadelphia and other Atlantic ports. On whole scrap situation with steel mills appears to be in best position in months. Limited pig iron supply requiring a high ratio of scrap in melts is sustaining demand and price for foundry cast scrap.

New York — Demand for open-hearth steel scrap is steady at unchanged prices, although there is some slackening in buying of turnings. Differential of $2 between heavy melting scrap holds. Cast prices are somewhat more mixed with several grades inclined to be easier. One cargo of foreign scrap has reached New York, presumably destined for Bethlehem, Pa., or Lackawanna, N. Y.

Boston — Well-graded heavy melting steel scrap frequently brings $2 over formula price here, but bulk of so-called controlled scrap moves at the formula level, $34.40 shipping point. Low phos sells up to $40. Demand for heavy open-hearth steel is active, but turnings are inclined to be slow. Cast buying is steady at prices generally unchanged. Cast supply has tightened and some yards are behind on deliveries against commitments.

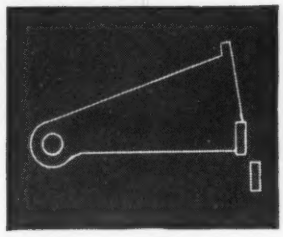
Buffalo — Indications that scrap prices would extend the recent upswing vanished last week as new sales, aggregating approximately 15,000 tons, were reported within prevailing ranges. When the market reached $42.25 for No. 2 heavy melting, pronounced strength swept trad-



PIVOTED-BLADE MAKES SHEARING

Fast . . Easy . . Accurate

Because of the pivoted-blade design, Steelweld Shears have several outstanding advantages heretofore unavailable in any shears at any price, which make shearing fast, easy, accurate:



EASY KNIFE ADJUSTMENT

A direct result of this design is the easy knife adjustment it makes possible. Knife clearance is quickly made to suit every plate thickness by simply turning a crank until pointer in an indicator is set for the metal to be cut. No bolts to loosen; no parts to move.

ELECTRIC FOOT CONTROL

The pivoted-blade design made the application of electric foot control a "natural." In fact it costs no more than the old-fashioned fatiguing mechanical foot treadle. For this reason it has been adopted as standard on all Steelweld Shears.

ALL-WELDED ONE-PIECE FRAME

Only because of the pivoted-blade design, was it possible to weld all parts of the frame into one solid integral unit. As there is no need of moving the bed to adjust for knife clearance, it, too, is welded permanently to the end housings. Since there are no bolted connections to loosen and misalign, deflections are minimized and long-time accuracy assured.

MANY MORE IMPORTANT FEATURES

These are a few of the features. There are many more. When you get the facts you will agree that no other shears compare with Steelwelds.

GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7813 EAST 282nd ST. WICKLIFFE, OHIO

STEELWELD PIVOTED BLADE SHEARS

ing and fear was expressed by some dealers that they might be caught short on contracts. Some paid above the $42.25 figure to cover sales. However, this excitement cooled off considerably when leading dealers continued to recognize mills' bids which were unchanged from the previous week. Prices, however, stiffened on top quality material with No. 1 heavy melting jumping $1 to $1.50 a ton to a range of $47 to $48. Firmer tendencies were noted, too, in low phos.

New business was reported also in turnings. This was indicative of a stronger market. Some consumers have been reluctant to purchase turnings at the advanced prices established early in the month. Mills are getting an increased flow of scrap but are still finding it difficult to build up reserve stocks. Only one of the three leading consumers is even close to having a satisfactory stockpile at the present time.

Detroit — Shipments for the past two weeks have been good and the market remains quiet. Ford is more comfortable on scrap now that automobile production has moved up nearer normal, and is not making outside purchases. Increasing dissatisfaction is being expressed, even among some steel mill scrap buyers, over the system of earmarking of scrap and pegging prices at so-called "formula" level. It is felt these artificial restraints on the market might well be released to the advantage of all concerned. Return of a really free market in scrap could result in restoration of the normal flow of materia and possibly lower prices.

Chicago — Short supply of scra is exerting a considerable influenc in the market, which shows a firme tone week by week. The result i increasing pressure against the re cently established formula of $42 a ton delivered for No. 1 heavy melting steel. There is little doubt tha steel mills will resist any early liftin of this level. Cast grades and railroad items continue to rise steadily several items having been pushed up from $1 to $4 a ton recently. Steelmaking operations are at a high level and are likely to continue so the balance of the year, consequently mills are pushing for all the tonnage they can get and hoping receipts will permit some improvement in inventory. Closing of its Indiana Harbor plant for an indefinite period for rehabilitation by American Steel Foundries has resulted in the company canceling all of its scrap orders for this plant, but the tonnage is not sufficient to work influence on the market.

Cincinnati—Prices in the iron and steel scrap market, with exception of those attributed to conversion deals, appear fairly stable. Brokers and dealers note louder complaints about the quality of some shipments. There has also been some backing away from the top prices on cast scrap although the demand continues heavy.

St. Louis — Scrap shipments remain at a low level. Prices are unchanged but sparring continues between dealers and melters. Considerable tonnage is being held back for higher prices at collection points, but mills so far have been successful in resisting increases. Prospects are the market will remain static until mills begin to worry about ground stocks, possibly in October. Only in isolated cases are tonnages changing hands at above-published prices. Mill scrap receipts are keeping up with the melt, but there is little adding to ground stocks, currently estimated at 30 to 45 days. This district is watching eagerly for the arrival of European scrap, feeling that its easing of scrap pressure in the East will reduce that area's long drain on midwest scrap.

Watervliet, N. Y. — Salvage Section, Watervliet Arsenal, will open bids Sept. 7 on sales of two lots of unprepared heavy melting steel scrap, amounting to 2000 and 15 gross tons, respectively.

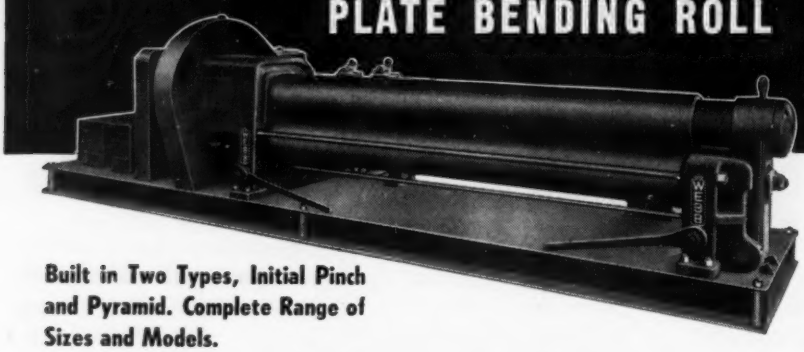
Los Angeles — No. 1 melting scrap is at $27.50 in the Los Angeles area, up $2.50 since July 26. The price reflects the nationally chronic demand and not necessarily a current local shortage. In fact, according to scrap analysis, there is at present no acute shortage although at the same time there is no oversupply.

Dealers are collecting at remote points. Mills are absorbing freight on the longer hauls. Wants are being satisfied, but behind day-to-day buying there lurks uncertainty.

This is based upon repeated forecasts which put the end of shipbreaking on a big scale at about next Jan. 1. By that time it is indicated that all the ships that are to come out of water for a long time will be out and broken up. The military

DESIGNED and BUILT TO DO THE JOB

THE WEBB PLATE BENDING ROLL



Built in Two Types, Initial Pinch and Pyramid. Complete Range of Sizes and Models.

Prompt Delivery on Standard Sizes.

Webb Plate Bending Rolls are designed and built for the forming of cylindrical shapes from rolled steel plate with greater speed and accuracy for high quantity production.

All Webb Rolls are backed by 65 years of continuous progress in the development of industrial machinery.

Write Today for Catalog No. 58

THE WEBB CORP.
MANUFACTURERS
WEBB CITY, MO.

rains of the nation will have called a halt to scrapping of all vessels save a relatively few of the landing craft type designed for Pacific beaches and now assuredly obsolete.

By the first of the year the Pacific Coast stands to lose 50,000 to 75,000 tons of scrap a month by reason of the shipbreaking stoppage. This is coupled with the fact that furnace facilities are increasing. Within six months, Kaiser facilities will have grown by 125,000 tons a year, Bethlehem, with its new electric furnace, by 75,000 tons a year and the Pacific States Steel Co. will have fired its new open hearths at Niles, Calif.

At present, actual scrap piles in the Los Angeles area would last from two to three months with no additions.

Seattle — Scrap prices remain unchanged and extremely firm at $26 gross, f.o.b. mill for No. 1 heavy. Some select shipments have been moved at $28. Cast iron scrap is not plentiful but supplies are ample for immediate foundry needs. Buyers are trying to hold the market at $40 maximum but eastern interests are making higher offers. Ship breaking plants find difficulty in obtaining enough surplus ships to keep their plants in full operation.

Tin Supply Rises 10 Per Cent

Washington — About 9000 tons of tin, or more than 10 per cent, were added to the current supply of tin available in the United States during the first half of this year, according to the Fourth Quarterly Report on Export Control and Allocation Powers, issued recently by the Secretary of Commerce.

The report read in part as follows:

"Tin imports in the first half of 1948 totaled 22,000 tons, considerably above the amount estimated in the third quarterly report. Imports of concentrates, which are not under international allocation, were also higher than expected, and an increase in the price of tin brought out a heavier secondary supply than had been estimated.

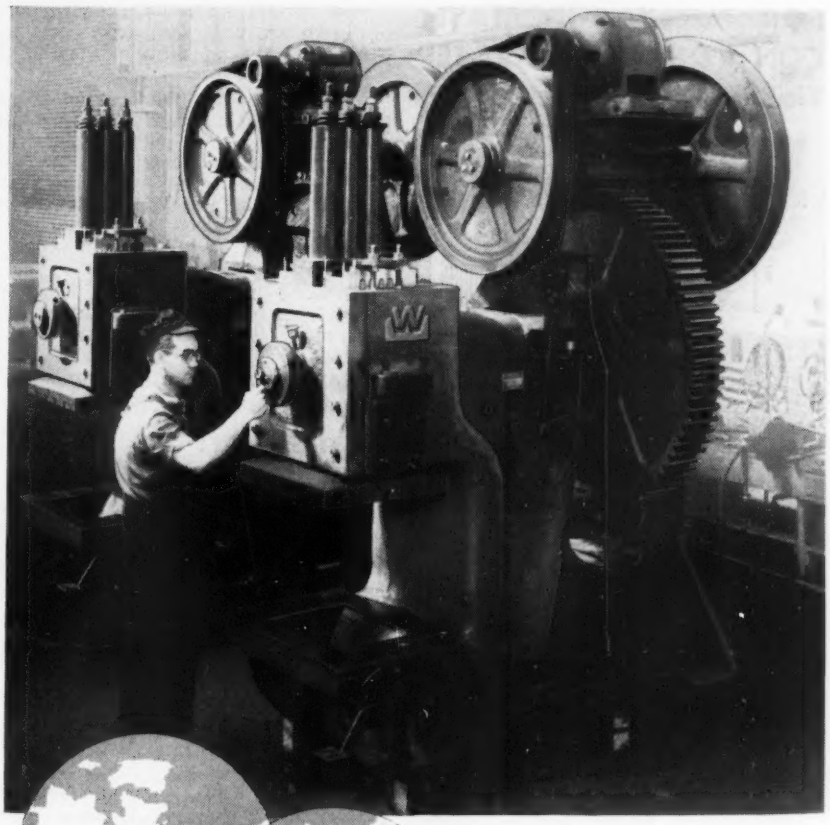
"The result of all these factors was to add about 9000 tons, or more than 10%, to the current supply of tin available in the United States during this period.

"Although it has not been expedient to relax controls over the distribution and use of tin, secondary tin is not subject to these restrictions, and the increase in the flow of scrap in the first six months of 1948 permitted a jump of 2,500 tons in domestic consumption over the level projected in the third quarterly report.

"The windfall in imports, however, was sufficient to increase total Government working stocks, exclusive of the strategic stockpile, by more than 6,000 tons during this period. These stocks stood at about 50,000 tons at mid-year, and industrial working stocks accounted for another 25,000 tons.

"Part of the Government stocks will be transferred to the strategic stockpile.

"It is probable that, in the absence of present controls, domestic demand for tin during the first half of this



WELL KNOWN . . .
FOR HIGHEST QUALITY

WILLIAMS-WHITE & CO.
Single end Punch. Capacity: 200 Tons

You can rely on the durability and precision of WILLIAMS-WHITE production machinery, famous the world over for quality and long service. Whatever your production needs may be, our staff of engineers and designers is always at your service.

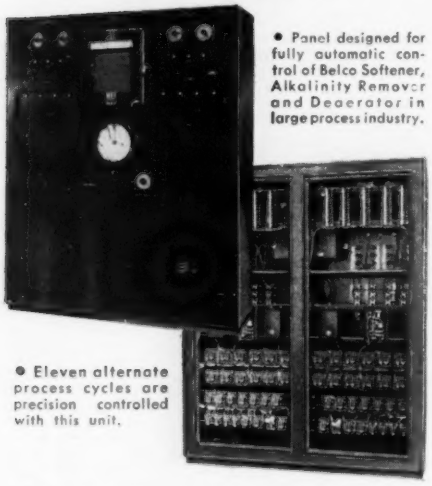
WILLIAMS-WHITE Punches, Presses, Hammers, Shears and Rolls are meeting the demand for tools of precision and efficiency in every branch of industry. Write us, giving as much information as possible about the tools you need and we will send detailed specifications.

MAKERS OF PRECISION PRODUCTION TOOLS FOR NEARLY 100 YEARS

WILLIAMS-WHITE & Co.
MOLINE, ILLINOIS

FOR FULLY AUTOMATIC CONTROL OF ALL WATER TREATMENT PROCESSES

EXPERIENCE COUNTS



• Panel designed for fully automatic control of Belco Softener, Alkalinity Remover and Deaerator in large process industry.

• Eleven alternate process cycles are precision controlled with this unit.

Belco engineers are thoroughly experienced in all phases of completely automatic water treatments. By applying this wide experience to your processes you can avoid the losses that result from outdated control — you can reap the savings that result from modern simplified automatic Belco control. Experience counts . . . Belco has, for example, the advantage gained through designing and building the worlds largest fully automatic demineralization and silica removal plant.

MODERNIZATION OF EXISTING PLANTS RESULTS IN LARGE OPERATING SAVINGS

Ask a Belco engineer how modernization might effect substantial savings in your present operations. Ask about the application of the Belco automatic controls to other processes in your plants.

BELCO INDUSTRIAL EQUIPMENT DIVISION, INC.
50 Iowa Avenue Paterson 3, N. J.
In midwest: Deady Chemical Co., Kansas City, Mo.
In southwest: Watermasters, Inc., Houston, Tex.
In Pacific: Deady Chemical Co., Los Angeles, Cal.

Belco

PROCESSES FOR REMOVAL OF WATER IMPURITIES

year would have been sufficient to absorb not only the entire new supply, but also to require dipping into accumulated stocks.

"This will also be true in the remainder of this year. These controls, which restrict the purposes for which tin and tin products may be used, serve to assure an equitable distribution of the limited supply amount for essential uses, while conserving tin in order to help attain stockpile objectives.

"Some uses, such as that for jewelry, are prohibited entirely, while in other cases, the amounts of tin which may be used are severely limited."

Rails, Cars . . .

Track Material Prices, Page 97

Pittsburgh — Relaying rail producers report price range from $64 to $69 a ton, an increase of about $4 over former quotations. It is pointed out that very little relaying rails are currently being released by the mills, while scrap dealers are bidding up prices for sale to foundries after cutting rails to specific lengths.

Canada . . .

Toronto, Ont. — While iron and steel production in Canada during June was below that of May, it was higher than the corresponding month last year.

Steel ingots and castings produced in June totaled 259,365 net tons, or a daily average of 83.4 per cent of total capacity, compared with 90.1 per cent for May and 81.7 per cent for June, 1947. June production included 249,710 tons of steel ingots and 9655 tons of steel castings.

Charges to steel furnaces in June included 135,079 tons of pig iron; 77,729 tons of scrap of consumers' own make and 77,275 tons of purchased scrap.

Production of pig iron in June was 183,763 net tons indicated a daily average of 81.4 per cent of rated capacity and compares with daily average of 82.9 per cent for May and 70.8 per cent for June last year. Output for June included 148,641 tons of basic iron of which 139,337 tons were for further use of producers and 9304 tons for sale; 18,809 tons of foundry iron with 840 tons for further use and 17,967 tons for sale; 16,313 tons of malleable iron, all for sale. During June, 12 of the 14 blast furnaces in Canada were blowing, and furnace charges included 320,484 tons of iron ore; 44,526 tons of mill sinder, scale, sinter, etc.; and 8854 tons of scrap.

Output of ferroalloys in June amounted to 13,502 net tons and included ferrosilicon, silicomanganese, ferromanganese, ferrochrome, chromx and ferrophosphorus.

Following are comparative production figures in net tons:

	Steel Ingots Castings	Pig Iron	Ferro-alloys
June, 1948	259,365	183,763	13,502
May, 1948	289,567	193,305	18,436
June, 1947	238,297	159,826	16,212
6 Months 1948..	1,595,596	1,031,693	89,653
6 Months, 1947..	1,483,281	973,153	77,750
6 Months, 1946..	1,449,639	876,023	68,991

Voluntary Plan for Petroleum

VOLUNTARY plan for allocation and equitable distribution of petroleum products, established under Public Law 395, has been approved by Interior Secretary J. A. Krug and Attorney General Tom Clark. Secretary Krug asked that all members of the petroleum industry comply with the plan, follow its recommendations and co-operate with other members of the industry in carrying out the activities it authorizes.

Plan provides that participating members shall direct their efforts to prevent consumer hardships resulting from insufficiency or disruption in supply of petroleum products. It provides for equitable distribution of available supplies among all customers after fulfilling essential requirements for military, food production and services essential to the public health and safety. It authorizes co-operative activities among industry members and with state and local fuel co-ordinators for the prevention and alleviation of consumer hardship.

Raw Materials Use in Steel Up

MORE fuel oil, electric power, coal and coke were consumed by the iron and steel industry in 1947 than in any previous year, reports the American Iron & Steel Institute.

More than 2 billion gallons of fuel oil were purchased, exceeding the total consumed in 1944, year of highest steel production, by about 110 million gallons.

The 94,272,000 net tons of coal utilized by the industry, a record tonnage, constituted 14 per cent of all anthracite and bituminous coal mined last year. More than 58 million tons of coke were made and used from it.

Twenty-one billion kilowatt hours of electricity were consumed by the industry last year, enough to supply all electrically equipped dwellings in the United States for almost five months. About 44 per cent of the electricity consumed was generated by the industry.

The largest peacetime consumption increase in the industry was in natural gas. Iron and steel companies used about 255 billion cubic feet last year, increase of 13.8 per cent over 1946.

Peacetime records were reached in utilization of fluxes, tar and pitch. About 6,369,000 net tons of fluxes were used in the three major types of steelmaking furnaces, and 266,114,233 gallons of tar and pitch were consumed.

1947 Best Safety Year in Steel

STEEL industry's year of greatest peacetime production was also its best safety record year, according to the American Iron & Steel Institute.

Frequency of accidents was held to a lower rate than in any previous year, in relation to hours of work. The industry was the third lowest in accident frequency among 40 major industries. Its record was 50 per cent better than the average of all industries combined.

The industry's accident severity rate during 1947 also was the lowest the National Safety Council has recorded to date for steel. That rate was 1.60 days lost per 1000 manhours of work, compared with 1.69 days lost in 1946. The industry ranked 28th among 40 major industries in 1947, from the standpoint of severity.

Each year during the past decade the industry has been among the leaders in safety. Five times in the ten years 1938-1947 it has placed third in low frequency of accidents. In three other years of that period it was fourth and in two years fifth.

The accident frequency rate in steel plants dropped 15 per cent during 1947, from 7.19 accidents per million man hours in 1946 to 6.08 last year. The rate in 1947 was the lowest yet recorded for the steel industry. In the same year, the average frequency rate for all industries declined 6.4 per cent, from 14.16 accidents per million manhours to 13.26 per million. The steel industry in 1947 showed a 54 per cent better record than that of all industries combined, while in 1946, steel was 46 per cent better than the average.

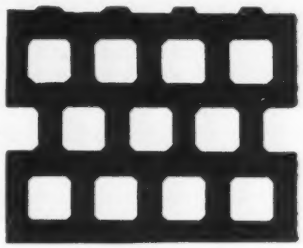
Sell Butane Equipment Assets

ASSETS of the Butane Equipment Co. Inc., Dallas, Tex., one of the country's largest fabricators of liquefied petroleum gas equipment and oil refinery equipment will be sold at public auction Sept. 14 in a liquidation sale. One of the reasons assigned by the owners as the reason to cease operations at the plant has been inability to obtain sufficient steel to operate such a large plant efficiently.

All machinery, land, office furniture, equipment and buildings are offered for sale. The plant, designed and used for heavy manufacturing, contains 40,000 sq ft of floor space and 80,000 sq ft of unimproved land adjoining the present operations. Installations include steel craneways, railroad spur, warehouse and small buildings, and completely paved concrete yard.

Perforated metal screens

for any requirement



WITH facilities for producing any shape and size of perforations in any commercially rolled metal, of whatever gauge desired, Hendrick can furnish the most suitable form for a specific screening application.

To best meet certain requirements, Hendrick developed the "squaround" perforation illustrated. Other standard forms include round, square, hexagonal, diamond and slot perforations in hundreds of sizes of openings. Write for full information.

SEE OUR CATALOG IN SWEET'S

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

HENDRICK
Manufacturing Company
30 DUNDAFF STREET, CARBONDALE, PENNA.
Sales Offices In Principal Cities

Predictable Castings Produced for Machining

It's surprising to learn how many manufacturers are looking for sound, accurate, predictable ferrous castings. Everywhere we go to talk about *Strenes Metal* cast dies, we are asked if we do the same quality of work in alloy gray iron and gray iron. When we answer yes, we are given a lot of jobs for machine beds, bases, columns, and other items which require good castings; and our customers keep coming back for more.

As everyone knows, it pays to go far, if necessary, to get close-grained castings free of porosity, cold shuts, blowholes, inclusions, and other defects revealed by machining. The extra transportation cost is insignificant compared to the reduction of tooling expense and avoidance of scrap.

If you have been unsuccessful in getting predictable castings for machining, communicate with us.

Write, phone, or wire.

THE ADVANCE FOUNDRY CO., 105 Seminary Ave., Dayton, Ohio

ADVANCE CASTINGS
STRENES METAL
ALLOY GRAY IRON
GRAY IRON

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2000 tons, plant, Continental Can Co., Milwaukee, to American Bridge Co., Pittsburgh.

740 tons, public school 14, Staten Island, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

660 tons, state highway bridge, Westchester county, New York, to American Bridge Co., Pittsburgh.

550 tons, state highway project, grade crossing; Queens, N. Y., to American Bridge Co., Pittsburgh.

450 tons, Oregon highway 535-foot bridge, to Poole, McGonigle & Dick, Portland, Oreg.; also 50 tons reinforcing to Mercer Steel Co., Portland; Don L. Cooney, Seattle, general contract, low bid $318,320.

300 tons, six logging track loaders and other equipment, to Washington Iron Works, Seattle.

230 tons, state highway bridge, Delaware county, Pennsylvania; to American Bridge Co., Pittsburgh.

150 tons, bridge towers for Alaska railroad, to Puget Sound Bridge & Dredging Co., Seattle.

130 tons, building, South Side Hebrew Congregation, Chicago, to Wendnagel & Co., Chicago.

100 tons, girders and angles for Public Safety building, Seattle, to Pacific Car & Foundry Co., Seattle.

Unstated, 14 sets radial gates and hoists for main canal, Columbia Basin project for Bureau of Reclamation, Denver, to United Engineering Co., San Francisco, and four other Pacific Coast plants, totaling about $90,000.

Unstated, 75-ton crane for machine shop, Coulee dam, to Cyclops Iron Works, San Francisco, low $67,943.

STRUCTURAL STEEL PENDING

4000 tons, veterans hospital, St. Albans, Long Island, N. Y.

4000 tons, railroad bridge, Burnside, Ky.

2000 tons, plant, Aluminum Co. of America, Point Comfort, Tex.

1000 tons, garage, board of transportation, New York, Schacht Steel Construction Co., Hillside, N. J., low.

800 tons, hospital, Williamsport, Pa.

600 tons, newspaper building, Richmond, Va.; bids in.

530 tons, state highway bridge, truss-250-foot approach spans, Montezuma-Port Byron, N. Y.; bids Sept. 15, Albany.

500 tons, bridge requirements for 1949, Great Northern Railroad, Chicago.

400 tons, state highway bridge, Delaware county, Pennsylvania; bids Sept. 10, Harrisburg.

350 tons, also 85 tons reinforcing, Bureau of Public Roads bridge near Salem, Oreg.; Port Construction Co., Port Angeles, Wash., low $185,588.

270 tons, state highway project, Wartburg connection, Cross county parkway, Westchester county, New York; bids Sept. 15, Albany.

260 tons, 138-foot, four-inch clear span solid floor deck plate girder bridge, to carry New Haven railroad tracks over U. S. route 1, Stonington, Conn.; N. Benenuti & Sons, New London, Conn., low on general contract.

200 tons, state hospital building, Danville, Pa.; bids Sept. 1, Harrisburg.

200 tons, also 60 tons reinforcing, bridge in Umpqua National forest, Oregon; bids to Bureau of Public Roads, Portland, Sept. 1.

100 tons, 92.5-foot skew span composite girder bridge, East Lyme, Conn.; S. & N. Construction Co., Providence, R. I., low on general contract.

REINFORCING BARS . . .

REINFORCING BARS PLACED

500 tons, bridges on Seward-Anchorage highway, Alaska, to Northwest Steel Rolling Mills, Inc., Seattle.

370 tons, staff housing, University of Illinois, Urbana, Ill., to Bethlehem Steel Co.

288 tons, music building, University of Washington, to Bethlehem Pacific Coast Steel Corp., Seattle; Strand & Sons, Seattle, general contract.

125 tons, Engineering building, Gonzaga College, Spokane, Wash., to Northwest Steel Rolling Mills Inc., Seattle; Gus J. Bouten, Spokane, general contract.

121 tons, Washington state bridges, to Bethlehem Pacific Coast Steel Corp., Seattle; Rumsey & Co., Seattle, and Clark Eldridge, Tacoma, general contractors.

100 tons, dry kiln, Weyerhaeuser Timber Co., Everett, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

2600 to 2900 tons, sixteen multistory apartment buildings, Chicago Housing Authority; S. N. Nielsen Co., Chicago, low on general contract; bids Aug. 17.

1000 tons or more, 6½-miles lining main canal, Columbia Basin project, Washington state; Western Contracting Co., Sioux City, Ia., low on three schedules; materials furnished by government.

550 tons, North Shore intercepting sewer, cont. No. 7, Chicago Sanitary District, Chicago; bids Sept. 2.

368 tons, pumping station, Madison, Wis.; La-Crosse Dredging Corp., Chicago, low on general contract; bids July 28.

360 tons, office building and warehouse, Horder's Inc., Chicago; George Sollitt Construction Co., Chicago, contractor; bids June 15.

357 tons, Hinsdale township high school, Hinsdale, Ill.; bids July 30.

240 tons, training school building, Normal University, Carbondale, Ill.; Federal Construction Co., Chicago, contractor; bids July 26.

100 tons, Washington state highway bridge, Okanogan county; bids in Aug. 27.

Unstated, state patrol highway building, Spokane, Wash.; bids to Olympia, Sept. 3.

Unstated, treatment plant, Seattle-Tacoma airport; Lease & Leighland, Seattle, low, $158,000.

Unstated, museum, Springfield, Ill., for State of Illinois; Lloyds Builders Inc., Chicago, contractor; bids June 29.

Unstated, three reservoirs and major water system improvements; bids soon; to Bellingham, Wash.; Cunningham & Associates, Portland, engineers.

Unstated, 3½ million gallon reservoir; bids to L. A. Flannigan, city clerk, Grants Pass, Oreg.; Cunningham & Associates, Portland, engineers.

PLATES . . .

PLATES PENDING

4000 tons, breakwater at Astoria, Oreg.; Macco Corp., Clearwater, Cal., awarded general contract at $1,248,325 by U. S. Engineer, Portland.

100 tons or more, design, fabrication and erection, two 100,000-gallon water tanks, 100-foot towers, and one 250,000-gallon, 80-foot tower, corps of engineers, Portland, Ore., district, for McNary, Ore.; bids in.

Unstated, 7000 feet of water mains; bids in to Astoria, Oreg.; American Pipe & Construction Co., Portland, apparently low on six types steel pipe; bids for alternatives also under consideration.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chicago, South Shore & South Bend, four 70-ton covered hoppers to General American Transportation Corp., Chicago.

Delaware & Hudson, 20 air dump cars to Magor Car Corp., Clifton, N. J.

Norfolk & Western, 10 steel caboose cars to St. Louis Car Co., St. Louis.

CONSTRUCTION AND ENTERPRISE

ALABAMA

GADSDEN, ALA.—Alabama Power Co., 600 N. 18th St., Birmingham, has awarded a $100,000 contract to Dunn Construction Co., First National Bank building, Birmingham, for a steam generating plant superstructure.

CALIFORNIA

PALO ALTO, CALIF.—Stanford University, Board of Trustees, plans to build a linear acceleration laboratory costing $175,000.

FLORIDA

TALLAHASSEE, FLA.—Tallahassee City Commission plans to build a $5 million electric generating plant; Reynolds Smith & Hills, P. O. Box 4817, Jacksonville, consulting engineers.

ILLINOIS

MONSANTO, ILL.—American Zinc Co. has awarded a $100,000 contract to Murch-Jarvis Co., 718 Locust St., St. Louis, for construction of a change house and warehouse.

INDIANA

INDIANAPOLIS—Western Electric Co., 195 Broadway, New York, has awarded a contract to the Austin Co., 16112 Euclid Ave., Cleveland, for a distribution house and garage on W. Eighteenth St., costing $800,000 and $325,000 respectively.

IOWA

DES MOINES, IOWA—Iowa Pipe & Tile Co., 900 E. 5th St., will spend $100,000 to build boiler and drier rooms at its manufacturing plant.

MICHIGAN

DEARBORN, MICH.—Ford Motor Co., 300 Schaefer St., has awarded two contracts; one to Darin & Armstrong, 2041 Fenkell, Detroit, for an open-hearth slag and skull-cracking building costing $500,000, and the other to Arthur O. Misch Co., 806 Ford Bldg. and O. W. Burke Co., 1032 Fischer building, Detroit, for docks with compensating elevating dock plates costing $1,250,000.

MINNESOTA

ST. PAUL, MINN.—International Harvester Co., 180 N. Michigan Ave., Chicago, has awarded a $1 million contract to Steenberg Construction Co., W. 1757 First National Bank building, for a parts depot.

NORTH CAROLINA

GREENSBORO, N. C.—Wysong & Miles Co. plans to construct a $100,000 foundry.

NORTH DAKOTA

FARGO, N. D.—Linde Air Products Co., Union Carbide and Carbon Corp., will start construction soon on an oxygen distributing station, acetylene producing plant, and a warehouse.

OHIO

CANFIELD, O.—Youngstown Steel & Alloy Co. has been incorporated by Arthur Eding, Ethel Medland and Chester C. Beard, 1118 Mahoning Bank Bldg.

CLEVELAND—Black Industries Inc., James Remeke, sales manager, 1400 E. 222 St., has spent $50,000 to develop a machine which will make 425 nails a minute and greatly reduce maintenance costs in nail production. Everything from a four-penny to an eight-penny nail can be made on the machine.

CLEVELAND—American Alloy Hard-Facing Inc., 7717 Spafford Pl., has been incorporated by Joseph S. Sedlak, George S. Hanki

PENNSYLVANIA IRON & STEEL CO.

Always Buying Turni... pennsteel ...ngs For Our Crusher
Always Buying Tu... For Our Crusher
Always Buying Tur... s For Our Crusher
Always Buying Turn... gs For Our Crusher
Always Buying Turni... ngs For Our Crusher
Always Buying Turnin... hings For Our Crusher
Always Buying Turning... rnings For Our Crusher

PENNSYLVANIA IRON AND STEEL COMPANY

37th & A.V.R.R. PITTSBURGH 1, PA. serving industry since 1912

UNIT 1020A

HEAVY DUTY

CLAMSHELL

Gas or Diesel

Built for Hard Use!

HANDLES EVERY SCRAP YARD JOB WITH EASE

Write for catalog showing UNIT'S many modern and exclusive features.

UNIT CRANE & SHOVEL CORP. MILWAUKEE 14, WIS., U. S. A.

A 5348-1/8

PERFORATED METALS OF EVERY DESCRIPTION

Promptly made to your exact specifications. We can furnish any size or style of perforations desired.

CHICAGO PERFORATING CO.
2443 W. 24th Place Canal 1459 Chicago, Ill.

Have It Galvanized by—

JOSEPH P. CATTIE & BROS., INC.
Gaul & Letterly Sts., Philadelphia, Pa.

Philadelphia's Oldest, The Country's Largest
Hot Dip Job Galvanizer • Galvanized Products Furnished Pickling and Oiling

STEEL AVAILABLE

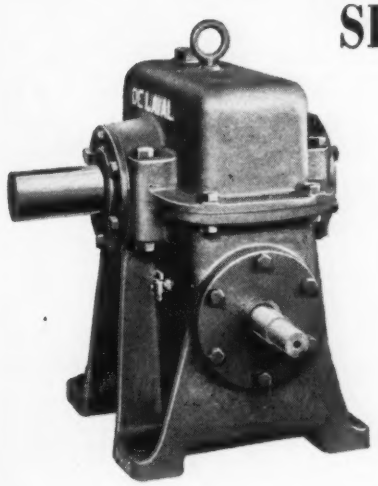
- For any type of perforation from 26 gauge to 3/16″ gauge. Accurate Workmanship Assured.

WRITE FOR DESCRIPTIVE CATALOG #10

ACCURATE PERFORATING CO.
1101 S. Kedzie Ave. • Chicago 12, Illinois

DE LAVAL GEAR REDUCERS *in* STOCK

CRATED FOR IMMEDIATE SHIPMENT



WG-22

These popular units are assembled, crated and ready for immediate shipment.

Reducer	*Ratio*	*Probable *HP Motor*	*Reducer*	*Ratio*	*Probable *HP Motor*
BW400	92⅔	5	BW600	112⅔	10
BW400	19½	3	BW600	19½	7.5
BW400	25	2	BW600	25	5
BW400	40	1.5	BW600	40	3
BW500	112⅔	7.5	BW700	92⅔	15
BW500	19½	5	BW700	19½	10
BW500	25	3	BW700	25	7.5
BW500	60	1.5	BW700	40	5

** Based on 1750 rpm—A.G.M.A. Class 1 Service. For other rpm's or Service refer to De Laval rating tables.*

Other sizes and ratios, in both single and double reductions, and in vertical and horizontal drives, also can be furnished promptly.

PHONE FOR QUICK SERVICE TO THESE
DE LAVAL SALES OFFICES

Atlanta, Ga. Walnut 8890
Boston, Mass. Liberty 2-5993
Charlotte, N. C. Charlotte 3-7549
Chicago, Ill. Harrison 3290
Cincinnati, Ohio Dunbar 4654
Cleveland, Ohio Henderson 7500
Denver, Colo. Main 0697
Detroit, Mich. Madison 0950
Houston, Texas Wentworth 3-2823
Indianapolis, Ind. Albert 9433
Kansas City, Mo. Harrison 0744
Los Angeles, Calif. Michigan 6003
New Haven, Conn. New Haven 8-3459
New Orleans, La. Raymond 0228
New York, N. Y. Bowling Green 9-1550
Philadelphia, Pa. Rittenhouse 6-8086
Pittsburgh, Pa. Court 5400
Rochester, N. Y. Stone 6950
St. Paul, Minn. Garfield 1836
Salt Lake City, Utah Salt Lake City 3-7933
San Francisco, Calif. Sutter 3426
Seattle, Wash. Elliott 3437
Tulsa, Okla. Tulsa 5-2151
Washington, D. C. National 9238

DE LAVAL STEAM TURBINE CO.
TRENTON 2, NEW JERSEY

and Stephen Krupienski to engage in hard facing of valves, metal parts of machinery and earth-moving equipment.

CLEVELAND—Acme Metal Products Co. has been chartered through Joseph H. Persky, attorney, 540 Guardian Bldg., to engage in aluminum smelting primarily and also to manufacture by-products.

CLEVELAND—Aluminum Smelting & Refining Co., 5463 Dunham Rd., Maple Heights, recently purchased by Harold H. Barnett, attorney, and associates for $300,000, will spend more than $50,000 for new equipment. The company melts scrap into ingots for die casters, steel companies and kitchen utensil manufacturers.

CLEVELAND—Bessemer Forging Co., S. Ollok, president, 7310 Bessemer Ave., has been incorporated for further expansion purposes. The company has just completed installation of new equipment to increase production for a contract received for farm implements used by coffee plantations in South America.

CLEVELAND — Exland Chemical Corp. has been incorporated by A. R. Shimola and George F. Shimola, Fidelity Bldg.

KENT, O.—Twin Coach Co., 850 W. Main St., will resume operations in the trolley coach field after having engaged in war production work since 1942.

KINSMAN, O. — Target Stamped Products Corp., H. B. Chatfield, president, Weirton, W. Va., will open a steel plant near here and will construct four buildings.

LIMA, O.—Standard Oil Co. of Ohio, Midland building, Cleveland, has awarded a contract to Arthur G. McKee & Co., 2300 Chester St., Cleveland, for a catalytic cracking plant including gas plant, water cooling tower, gasoline treatment and blending facilities, additions to tankage facilities; and an oil refining unit, combination crude oil distillation and coking plant, costing $11 million and $5 million respectively.

TEXAS

GRAND PRAIRIE, TEX. — Chance Vought Aircraft Corp. has awarded a $250,000 contract to James Stewart & Co. Inc., Magnolia building, Dallas, to construct a metalite shop; Albert Kahn, 345 New Center Bldg., Detroit, Mich., architect.

HOUSTON, TEXAS—Phillips Chemical Co. and Phillips Petroleum Co., Bartlesville, Okla., are planning to build an additional ammonium sulphate plant and units for manufacture of chemicals from other than petroleum derivatives, costing $30 million.

HOUSTON, TEX.—Texas Pipe Line Co. plans to build a crude oil pipeline carrier between W. Columbia and Port Neches, Port Arthur areas.

SAN DIEGO, TEX.—Coast Oil Corp. is planning to build a gasoline refinery costing $750,000.

WASHINGTON

TACOMA, WASH.—American Smelting & Refining Co. plans construction of a sulphuric acid plant at local smelter, plant fumes to be processed.

TACOMA, WASH.—Mill Machine Mfg. Co. has been incorporated by William T. Bond and associates with a capital investment of $100,000.

WISCONSIN

CUDAHY, WIS.—Ladish Drop Forge Co., 5481 S. Packard Ave., plans to erect a $17[illegible],000 factory addition.

MILWAUKEE—Cream City Container Corp., 229 E. Wisconsin Ave., plans to construct a $350,000 factory; N. Glickman, 4484 N. 26th St., engineer.

MILWAUKEE—U. S. Plywood Co., 1483 N. Water St., is planning to build a $12[illegible],000 factory.

MILWAUKEE, WIS.—Chicago, Milwaukee, St. Paul & Pacific railroad, R. J. Middleton, chief engineer, Union Station, Chicago, has awarded a contract to Siesel Construction Co., 514 E. Ogden Ave., for construction of a diesel plant.

CANADA

LONDON, ONT.—Kelvinator of Canada Ltd., Dundas St., has awarded a $100,000 contract to Hyatt Bros., 290 Egerton St., for erection of a plant addition.

TORONTO, ONT.—Mall Tool Ltd., 7740 S. Chicago St., has awarded a $100,000 contract to W. C. Breman Contracting Co. Ltd., 400 Gage St. N., Hamilton, for erection of a plant on Queen Elizabeth highway near Etobicoke township; J. A. Hewitt, Richmond Hill, architect.

TORONTO, ONT.—Dominion Bridge Co. Ltd., 1139 Shaw St., is planning to build a $90,000 shop.

WELLAND, ONT.—Page-Harsey Tubes Ltd. is planning to build a $500,000 electric weld pipe mill.

CAP DE LA MADELEINE, QUE.—Electro Refractories & Alloys Corp., Vars building, Buffalo, is planning to construct a $350,000 plant to manufacture silicon carbon.

PRICES OF LEADING FERROALLOYS PRODUCTS

(Concluded from Page 99)

c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c c.l. packed 6.05c, ton lots 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.: Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va.; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone contract, 100 lb or more, 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l., and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Graphidox No. 4: (Si 56%, Ca 5%, Ti 9%) C.l. packed, 16.50c per lb. of alloy; ton lots 17.90c; less ton lots 19.40c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%; V-7, Cr 28-32%, Si 15-21%, Mn 14-16%) C.l. packed, 12.95c per lb. of alloy; ton lots 14.60c; less ton lots 15.85c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, fob sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.